

HS 637944

REPORT NUMBER: 201U-CAL-05-04

**SAFETY COMPLIANCE TESTING FOR FMVSS 201
OCCUPANT PROTECTION IN INTERIOR IMPACT
UPPER INTERIOR HEAD IMPACT PROTECTION**

**GENERAL MOTORS OF CANADA LTD.
2005 BUICK LACROSSE 4-DOOR SEDAN**

NHTSA NUMBER: C50104

CALSPAN TEST NUMBER: 8754-FMH-04

CALSPAN
TRANSPORTATION SCIENCES CENTER
P.O. BOX 400
BUFFALO, NEW YORK 14225



Test Date: March 24, 2005

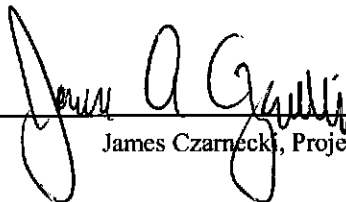
FINAL REPORT

PREPARED FOR:

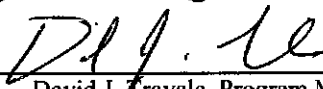
U. S. DEPARTMENT OF TRANSPORTATION
National Highway Traffic Safety Administration
Safety Assurance
Office of Vehicle Safety Compliance
Mail Code: NVS-220, Room 6111
400 Seventh Street, SW
Washington, DC 20590

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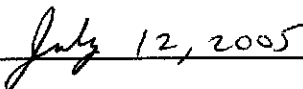
Prepared by:


James Czarniecki, Project Engineer

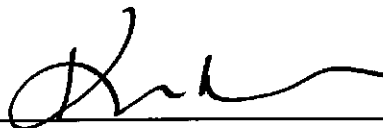
Approved by:



David J. Travale, Program Manager
Transportation Science Center

Approval Date:


July 12, 2005

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NHTSA, Office of Vehicle Safety Compliance


9/1/2005
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16. <i>Abstract</i> Compliance tests were conducted on the subject vehicle a 2005 Buick LaCrosse 4-Door Sedan in accordance with the specifications of the Office of Vehicle Safety Compliance Test Procedure TP-201U-01 for determination of FMVSS 201 compliance. Test failures identified were as follows in the table below:					
Target Point	Horizontal	Vertical	Velocity	HIC	HICd
URBP	270°	38°	23.6	1233.1	1096.7
-	-	-	-	-	-
17. <i>Key Words</i> Compliance Testing Safety Engineering FMVSS 201U			18. <i>Distribution Statement</i> Copies of this report are available from: NHTSA Technical Reference Division National Highway Traffic Safety Admin. 400 Seventh St., SW Washington, DC 20590 Telephone No.: 202-366-4946		
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SECTION 1

PURPOSE AND TEST PROCEDURE

This head impact compliance test is part of the FMVSS 201 Upper Interior Head Impact Protection Test Program sponsored by the National Highway Traffic Safety Administration (NHTSA) under Contract No. DTNH22-04-C-01027. The purpose of this head impact compliance test was to determine whether the subject vehicle, a 2005 Buick LaCrosse 4-Door Sedan, NHTSA No. C50104, meets the performance requirements of FMVSS 201, Occupant Protection in Interior Impact. The compliance test was conducted in accordance with the OVSC Laboratory Test Procedure No. TP-201U-01 dated April_03, 1998.

SECTION 2

SUMMARY OF UPPER INTERIOR HEAD IMPACTS

A 2005 Buick LaCrosse 4-Door Sedan , NHTSA No.C50104 , was impacted at various locations throughout its upper interior by a 4.54 kg 50th percentile headform. A total of twelve (12) impacts were performed in this test series. The target area impacts were chosen by the NHTSA Contracting Officers Technical Representative (COTR). A summary of test results can be found on data sheet 2-1. The twelve (12) area chosen for testing were:

OP2	SR3	RP1	BP3	BP1
AP3	AP1	BP2	URBP	AP2
FH1	SR2A			

The selected impact areas on the test vehicle appeared to comply with the performance requirements of FMVSS 201 with the exception of URBP impact area.

Five Free Motion Headforms (FMH), were used in this test series. All five FMH's were calibrated prior to and after the test series. Calibration information are included in Appendix B. Each FMH weighed 4.54 ± 0.5 kg and has an orthogonal tri-axis accelerometer pack mounted at the center of gravity (c.g.).

A total of three (3) channels of data for each target impact test are recorded on a Keyser-Threde data acquisition system. Data plots along with still photographs can be found in Section 3 of this report.

To document each target area impact test, one Weinberger high-speed video camera was placed at various locations to view the headform contact with the selected target area.

DATA SHEET 2-1

SUMMARY OF UPPER INTERIOR HEAD IMPACT TESTS

VEHICLE YEAR/MAKE/MODEL/STYLE:	2005 Buick LaCrosse 4-Door Sedan
VIN:	2G4WC532451200267
DATE OF MANUFACTURE:	10/04(SEE CERTIFICATION LABEL)
COLOR:	Red

TARGET CODE	Target Coordinates						Approach Angles (degrees)		Velocity (kph)	FMH HIC	HIC(d)
	Driver Side			Passenger Side			Horizontal	Vertical			
	X(mm)	Y(mm)	Z(mm)	X(mm)	Y(mm)	Z(mm)					
AP1	2921.01	-542.24	1442.06	2928.36	541.83	1449.76	132°	27°	23.46	641.7	650.5
AP2	2793.98	-604.03	1354.06	2809.67	605.17	1360.67	210°	40°	23.72	800.1	770.1
AP3	2697.71	-630.83	1300.53	2701.84	631.25	1302.91	125°	38°	23.89	668.1	664.9
BP1	3462.58	-473.51	1533.64	3462.86	476.08	1536.86	90°	21°	23.72	711.2	703.0
BP2	3435.10	-611.58	1306.12	3439.31	615.05	1304.88	270°	14°	23.83	933.9	871.0
BP3	3389.06	-615.89	1348.15	3392.34	618.16	1349.19	90°	-4°	23.64	350.1	430.5
BP4	3486.71	-661.23	1254.32	3491.09	663.25	1255.77	-	-	-	-	-
FH1	2869.74	-449.53	1491.87	2871.52	442.96	1494.24	Relocated 1 circle		-	-	-
FH1_R1	2861.13	-430.09	1492.02	2860.74	429.31	1492.51	180°	50°	23.74	570.7	597.0
FH2	2859.00	-302.10	1504.10	2860.09	294.08	1506.59	-	-	-	-	-
OP1	4180.52	-462.93	1518.06	4181.09	462.28	1524.34	-	-	-	-	-
OP2	4246.18	-628.43	1349.94	4248.04	623.72	1354.80	90°	9°	23.54	801.5	771.1
RH1	4261.25	-363.85	1507.29	4260.01	363.97	1512.40	-	-	-	-	-
RP1	4239.37	-498.71	1485.26	4234.16	502.63	1487.27	Relocated 1 circle		-	-	-
RP1_R1	4229.51	-514.29	1468.39	4217.70	512.90	1473.61	84°	24°	23.66	775.5	751.5
RP2	4453.03	-625.31	1334.93	4455.61	622.30	1337.40	Relocated 8 circles		-	-	-
RP2_R8	4298.08	-550.10	1429.24	4326.86	557.55	1420.58	-	-	-	-	-
SR1	3070.98	-494.68	1501.09	3078.97	498.62	1512.92	Relocated 1 circle		-	-	-
SR1_R1	-	-	-	3061.28	502.76	1499.08	-	-	-	-	-
SR2A	3220.44	-487.04	1522.96	3229.85	497.22	1540.94	270°	33°	23.48	820.3	785.3
SR2A_R2	-	-	-	3230.45	512.42	1512.11	Relocated 2 circles		-	-	-
SR2B	3162.64	-488.27	1517.02	3162.58	499.83	1536.25	Relocated 1 circle		-	-	-

SR2B_R1	-	-	-	-	3147.93	482.43	1518.02	-	-	-	-	-	-
SR3	3925.80	-461.28	1522.10	1527.37	3926.65	461.77	1527.37	90°	35°	23.36	781	755.6	-
UR_AP	3089.87	-398.36	1528.07	1531.31	3089.86	390.13	1531.31	-	-	-	-	-	-
UR_BP	3462.97	-382.54	1586.10	1589.19	3462.25	383.26	1589.19	270°	38°	23.6	1233.1	1096.7	-
UR_RP	4099.99	-393.23	1550.05	1553.87	4098.74	394.37	1553.87	-	-	-	-	-	-
UR_SR	3821.41	-385.98	1584.30	1578.65	3243.65	380.58	1578.65	-	-	-	-	-	-

*HIC(d)=0.75446(Free Motion Headform HIC)+166.4

DATA SHEET 2-2

GENERAL TEST AND VEHICLE PARAMETER DATA

TEST VEHICLE INFORMATION:									
Year/Make/Model/Body Style:				2005 Buick LaCrosse 4-Door Sedan					
VIN:				2G4WC532451200267					
Month & Year of Manufacture:				10/04(SEE CERTIFICATION LABEL)					
Vehicle Body Color:				Red					
Engine Data:	6	Cylinders;	-	CID;	3.9	Liters;	-	cc	
Engine Placement:		x	Longitudinal;	or		-	Lateral		
Transmission:	4	Speed;	-	Manual;	x	Automatic;	-	Overdrive	
Final Drive:	-	Rear Wheel Drive;	x	Front Wheel Drive;	-	Four Wheel Drive			
Odometer Reading:		12	km						
Options:	x	A/C;	x	Power Steering;	x	Pwr.Brakes;	x	Pwr. Windows	
Interior Trim Information :									
1. Adjustable seat belt anchorages located vehicle B-Pillars.									
2. Front passenger side rail grab handle.									
3. Rear outboard occupant grab handles located on side rails.									

DATA FROM TIRE PLACARD:									
Tire Pressure (at capacity);				210		kPa FRONT			
				210		kPa REAR			
Recommended Tire Size:				P225/60R16					
Tires on Test Vehicle:		P225/60R16		Manufacturer:		Goodyear			
Vehicle Capacity Data:									
Number of Occupants:	2	Front;	3	Rear;	-	3rd Seat;	5	Total	
Type of Front Seats:	x	Bucket;	-	Bench;	-	Split Bench			
Type of Front Seat Back:	-	Fixed;	x	Adjustable with	x	Lever or	-	Knob	
Vehicle Capacity Weight (VCW)=				416		kg (A)			
No. of Occupants x 68 kg. =				340		kg (B)			
Rated Cargo/Luggage Weight (RCLW) =				76		kg (A-B) Max. RCLW = 136 kg.			

DATA SHEET 2-2

GENERAL TEST AND VEHICLE PARAMETER DATA (cont.)

TEST VEHICLE DELIVERED WEIGHT WITH MAXIMUM FLUIDS:					
Left Front =	489	kg	Left Rear =	293	kg
Right Front =	508	kg	Right Rear =	296	kg
TOTAL FRONT =	997	kg	TOTAL REAR =	589	kg
% of Total Weight =	62.9	%	% of Total Weight =	37.1	%
TOTAL WEIGHT =	1586		kg		

CALCULATION OF VEHICLE'S TARGET TEST WEIGHT:		
Total Test Vehicle Delivered Weight=	1586	kg (A)
+ Rated Cargo/Luggage Weight =	76	kg (B)
TEST VEHICLE TARGET WEIGHT =	1662	kg (A+B)

WEIGHT OF TEST VEHICLE (FULLY LOADED):					
Left Front =	484	kg	Left Rear =	331	kg
Right Front =	505	kg	Right Rear =	333	kg
TOTAL FRONT =	989	kg	TOTAL REAR =	664	kg
% of Total Weight =	59.8	%	% of Total Weight =	40.2	%
TOTAL TEST WEIGHT =	1653				
Weight of vehicle secured in test vehicles cargo area =	65		kg		

TEST VEHICLE ATTITUDE (all dimensions in millimeters):				
AS DELIVERED:	Left Front	757	Left Rear	755
	Right Front	754	Right Rear	751
FULLY LOADED:	Left Front	756	Left Rear	735
	Right Front	752	Right Rear	730
Test Vehicle Wheelbase:	2800		millimeters	

TEST VEHICLE PITCH AND ROLL ANGLES:				
AS DELIVERED:	PITCH ANGLES		ROLL ANGLES	
	Left Door Sill	↑0.2	Front Bumper	↑0.1
	Right Door Sill	↓0.3	Rear Bumper	0.0
FULLY LOADED:	PITCH ANGLES		ROLL ANGLES	
	Left Door Sill	↓0.2	Front Bumper	↑0.2
	Right Door Sill	0.0	Rear Bumper	↓0.3
AS TESTED:	PITCH ANGLES		ROLL ANGLES	
	Left Door Sill	0.0	Front Bumper	↑0.1
	Right Door Sill	↓0.3	Rear Bumper	↓0.1

DATA SHEET 2-3

APPROACH ANGLE LIMITS

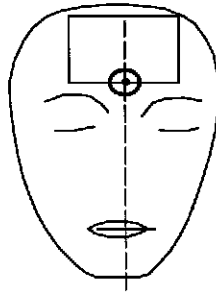
Target Code	Left Side				Target Code	Right Side			
	Horizontal Angles (deg.)		Vertical Angles (deg.)			Horizontal Angles (deg.)		Vertical Angles (deg.)	
	Minimum	Maximum	Minimum	Maximum		Minimum	Maximum	Minimum	Maximum
AP1	203	255	-5	27	AP1	105	157	-5	27
AP2	203	255	-5	40	AP2	105	157	-5	40
AP3	203	255	-5	38	AP3	105	157	-5	38
BP1	204	283	-10	21	BP1	77	156	-10	21
BP2		ANY	0	14	BP2		ANY	0	14
BP3	204	283	-10	-4	BP3	77	156	-10	-4
BP4	204	283	-10	-7	BP4	77	156	-10	-7
OP1		270	-10	19	OP1		90	-10	19
OP2		270	-10	9	OP2		90	-10	9
RP1	270	345	-10	24	RP1	15	90	-10	24
RP2	270	345	-10	27	RP2	15	90	-10	27
FH1		180	0	50	FH1		180	0	50
FH2		180	0	50	FH2		180	0	50
RH		360	0	50	RH		0	0	50
SR1		270	0	36	SR1		90	0	36
SR2A		270	0	33	SR2A		90	0	31
SR2B		270	0	42	SR2B		90	0	42
SR3		270	0	35	SR3		90	0	35
URAP		ANY	0	50	URAP		ANY	0	50
URBP		ANY	0	38	URBP		ANY	0	38
URRP		ANY	0	50	URRP		ANY	0	50

Note : BP2 target location – Seat belt anchorage

DATA SHEET 2-4

SUMMARY TARGET IMPACT LOCATION ON FMH

VEHICLE YEAR/MAKE/MODEL/STYLE:	2005 Buick LaCrosse 4-Door Sedan
VIN:	2G4WC532451200267
DATE OF MANUFACTURE:	10/04(SEE CERTIFICATION LABEL)
COLOR:	Red



↖ RIGHT SIDE OF FACE

TARGET	Distance Above Point O (mm)	Distance Over From Pt. O (mm)
OP2	21	2 LEFT
SR3	14	6 LEFT
RP1	10	15 LEFT
BP3	10	45 RIGHT
BP1	8	5 RIGHT
AP3	20	6 RIGHT
AP1	28	35 RIGHT
BP2	12	17 LEFT
URBP	58	15 LEFT
AP2	35	24 RIGHT
FH1	24	14 RIGHT
SR2A	15	5 LEFT

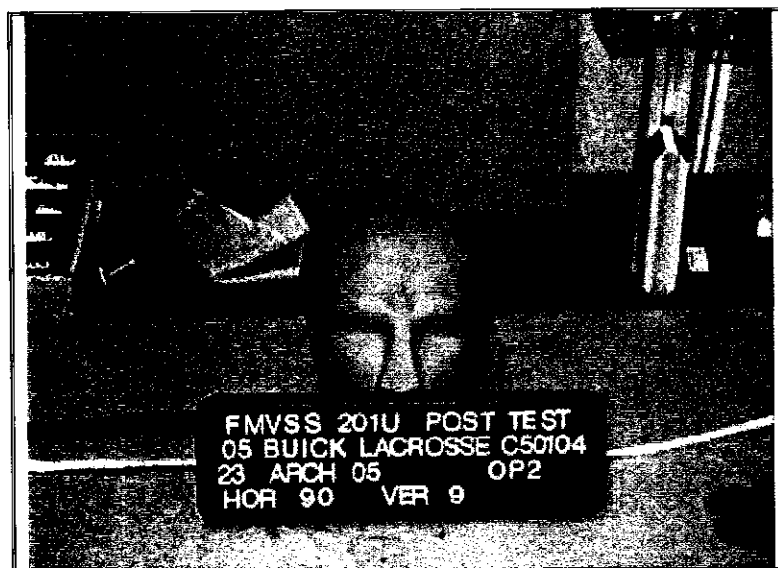
SECTION 3

SUMMARY OF TEST RESULTS AND DATA PLOTS

VEHICLE YEAR/MAKE/MODEL/STYLE:	2005 Buick LaCrosse 4-Door Sedan
VIN:	2G4WC532451200267
DATE OF MANUFACTURE:	10/04(SEE CERTIFICATION LABEL)
COLOR:	Red

Test Number:	01
Test Date:	03/23/05
Target Location:	Other Pillar
Target Code:	OP2
Horizontal Impact Angle:	90°
Vertical Impact Angle:	9°
Ambient Temperature:	24.2C°
Relative Humidity:	13.9
Time of Impact:	9:20
Headform Number:	62

Impact Point Description (from lower midpoint on midsagittal line)				
On Centerline	2	<input type="checkbox"/>	mm right	<input checked="" type="checkbox"/> mm left
On Centerline	21		mm up	



POST-IMPACT OP2 HEADFORM

Free Motion HIC	801.5
HIC(d)	771.1
Impact Velocity (kph)	23.54
HIC T1 (msec)	4.3
HIC T2 (msec)	10.6

FMVSS 201U IMPACT TEST - 2005 Buick Lacrosse Sedan C50104 - OP2

FMH Headform 0062

Location: OP2

Test Date: March 23, 2005

Work File: OP2

-----TEST RESULTS-----

Lab Temperature: 24.2 C

HICd: 771.1

Lab Humidity: 13.9 %

HIC (36ms): 801.5

Velocity at Impact: 23.54 KPH

t1: 4.3 msec

t2: 10.6 msec

Free Flight Distance: 207.73 mm

Duration: 6.3 msec

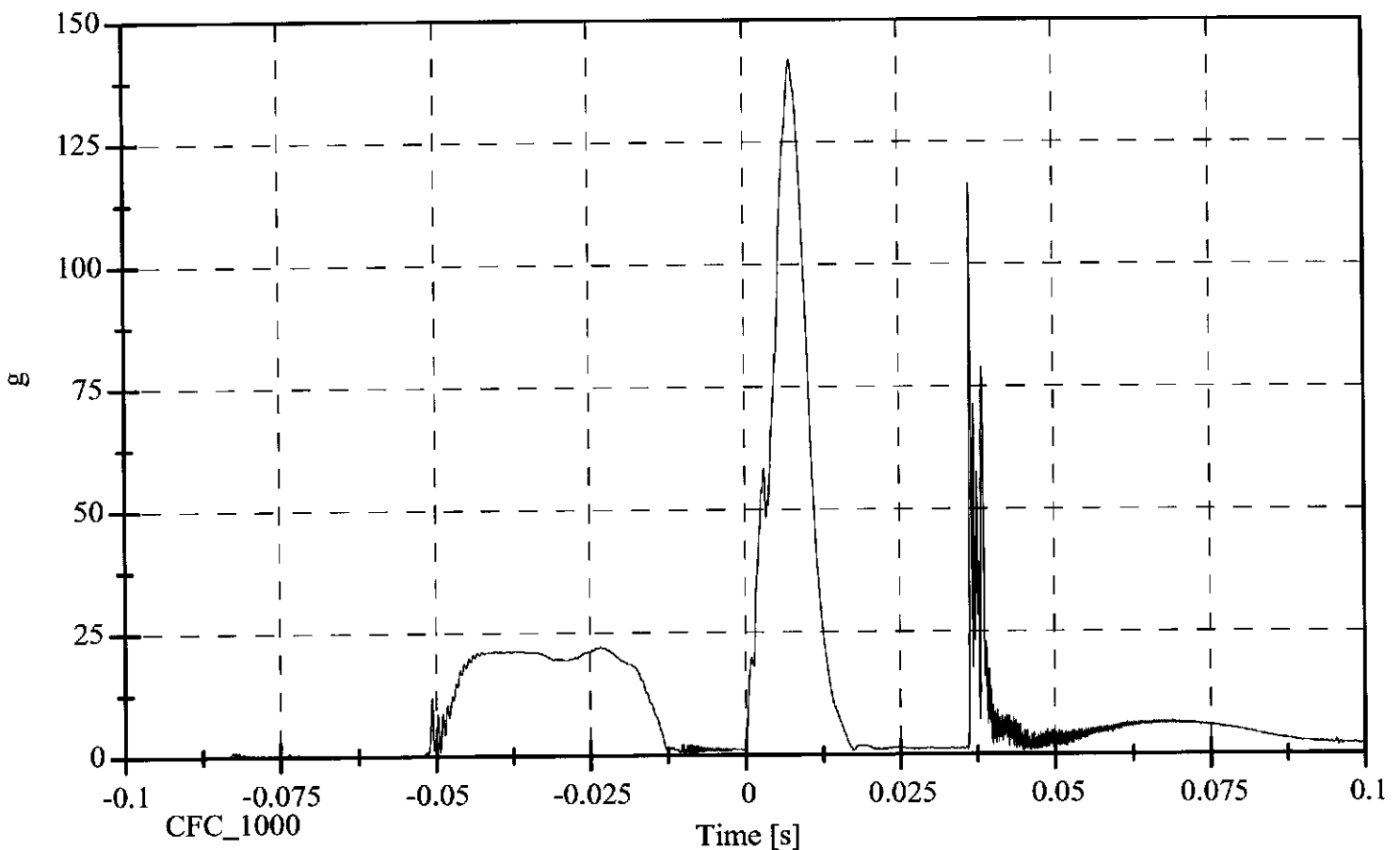
Maximum: 141.9 g

Average Acceleration: 10.5 g

FMVSS 201U IMPACT TEST - 2005 Buick Lacrosse Sedan
Headform Resultant

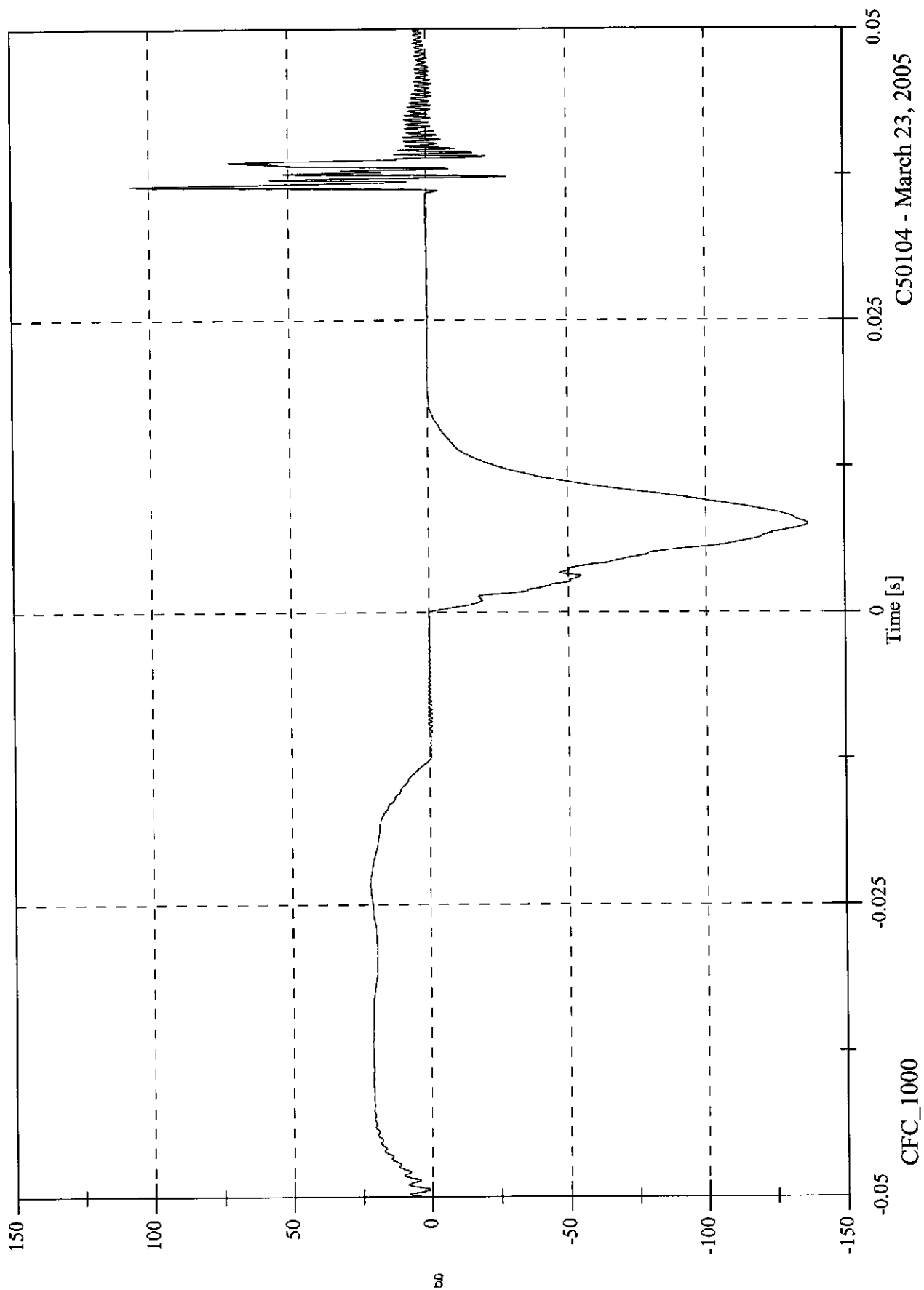
Max: 141.9 [g] at 0.008 [s]

Min: 0.0 [g] at -0.055 [s]



FMVSS 201U IMPACT TEST - 2005 Buick Lacrosse Sedan
Headform X Acceleration

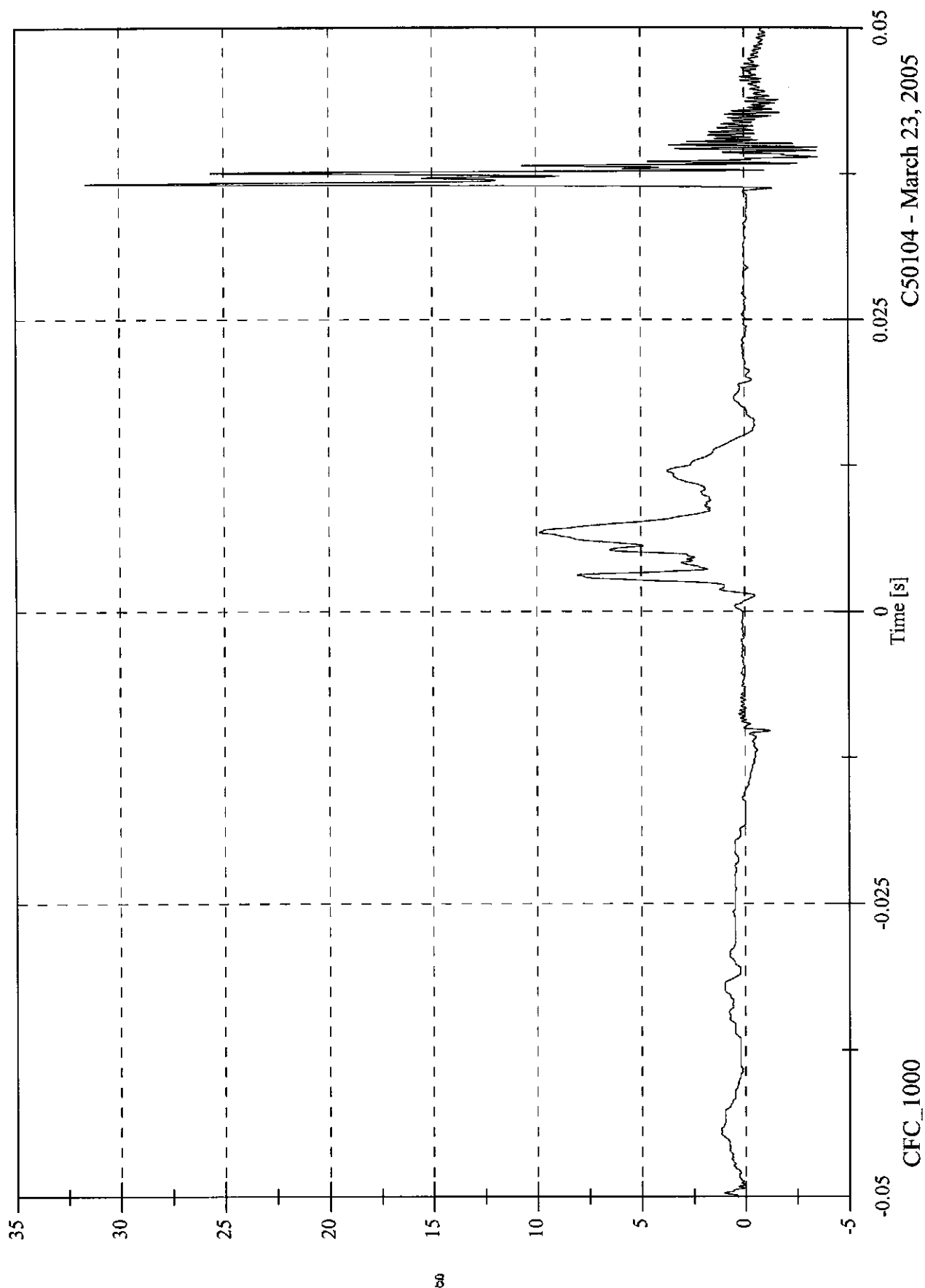
Max: 106.8 [g] at 0.037 [s]
Min: -136.7 [g] at 0.008 [s]



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FMVSS 201U IMPACT TEST - 2005 Buick Lacrosse Sedan
Headform Y Acceleration

Max: 31.6 [g] at 0.037 [s]
Min: -3.5 [g] at 0.039 [s]

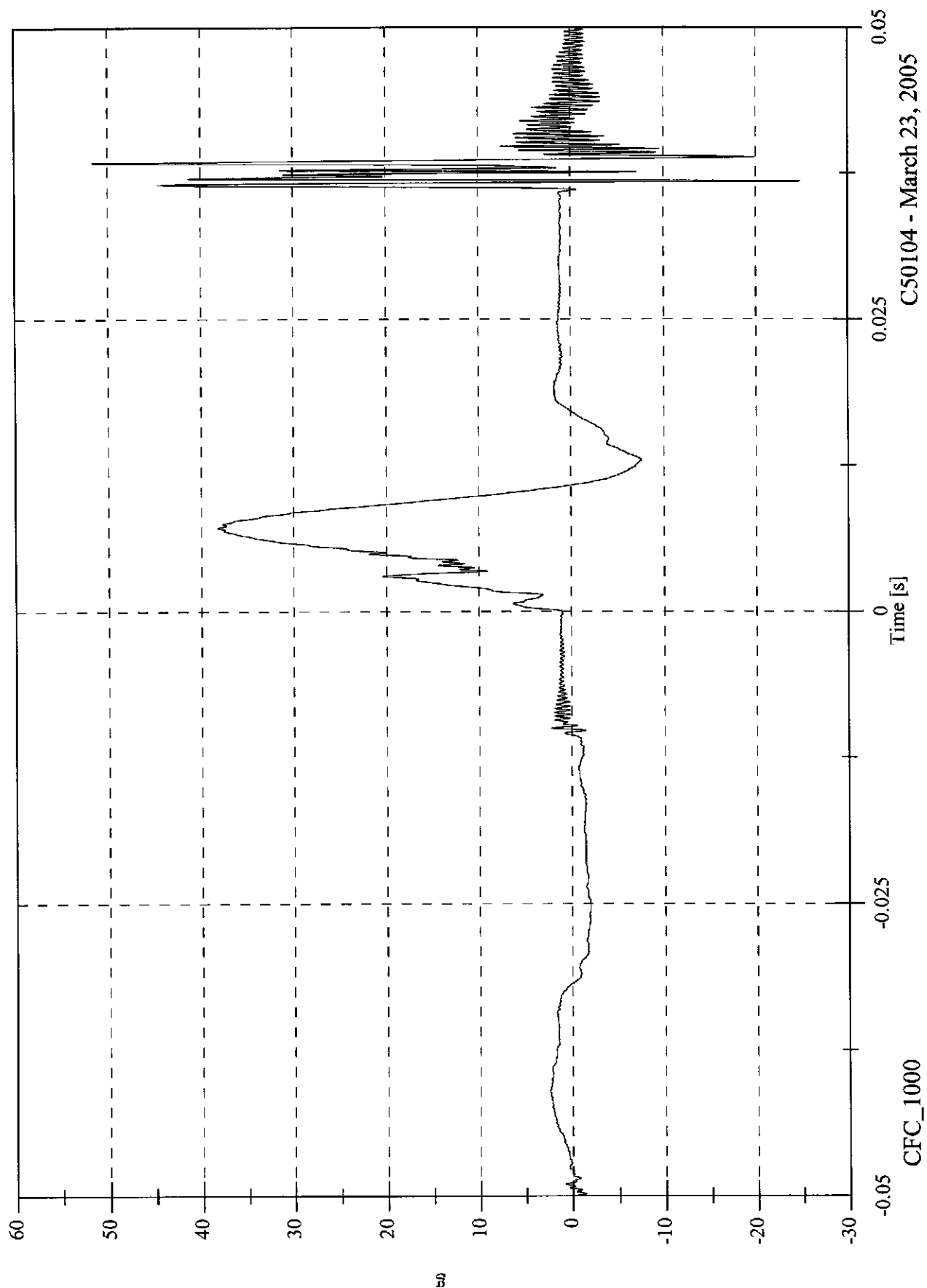


FMVSS 201U IMPACT TEST - 2005 Buick Lacrosse Sedan

Headform Z Acceleration

Max: 51.6 [g] at 0.038 [s]

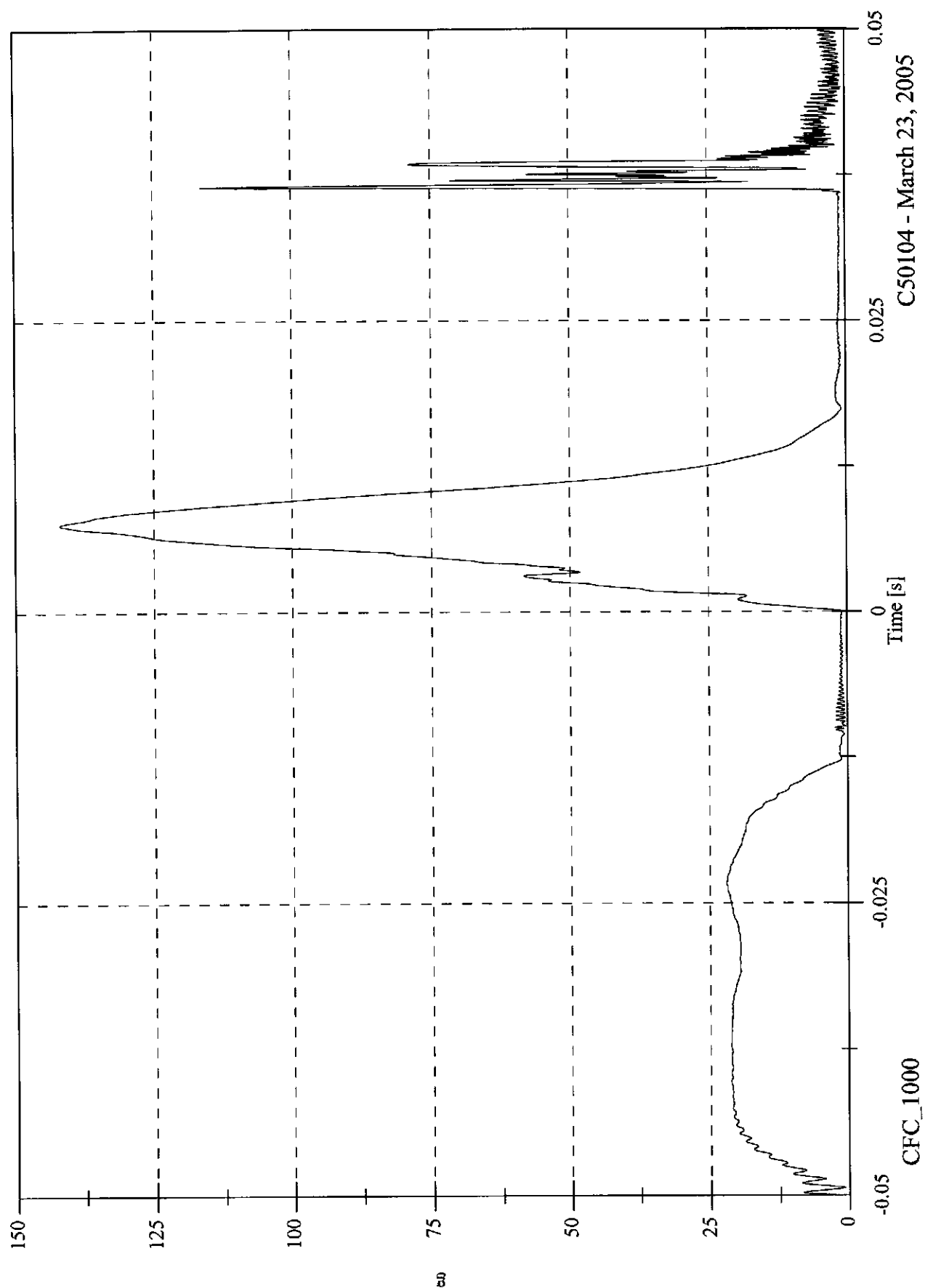
Min: -24.8 [g] at 0.037 [s]



Max: 141.9 [g] at 0.008 [s]
Min: 0.3 [g] at -0.010 [s]

FMVSS 201U IMPACT TEST - 2005 Buick Lacrosse Sedan

Headform Resultant

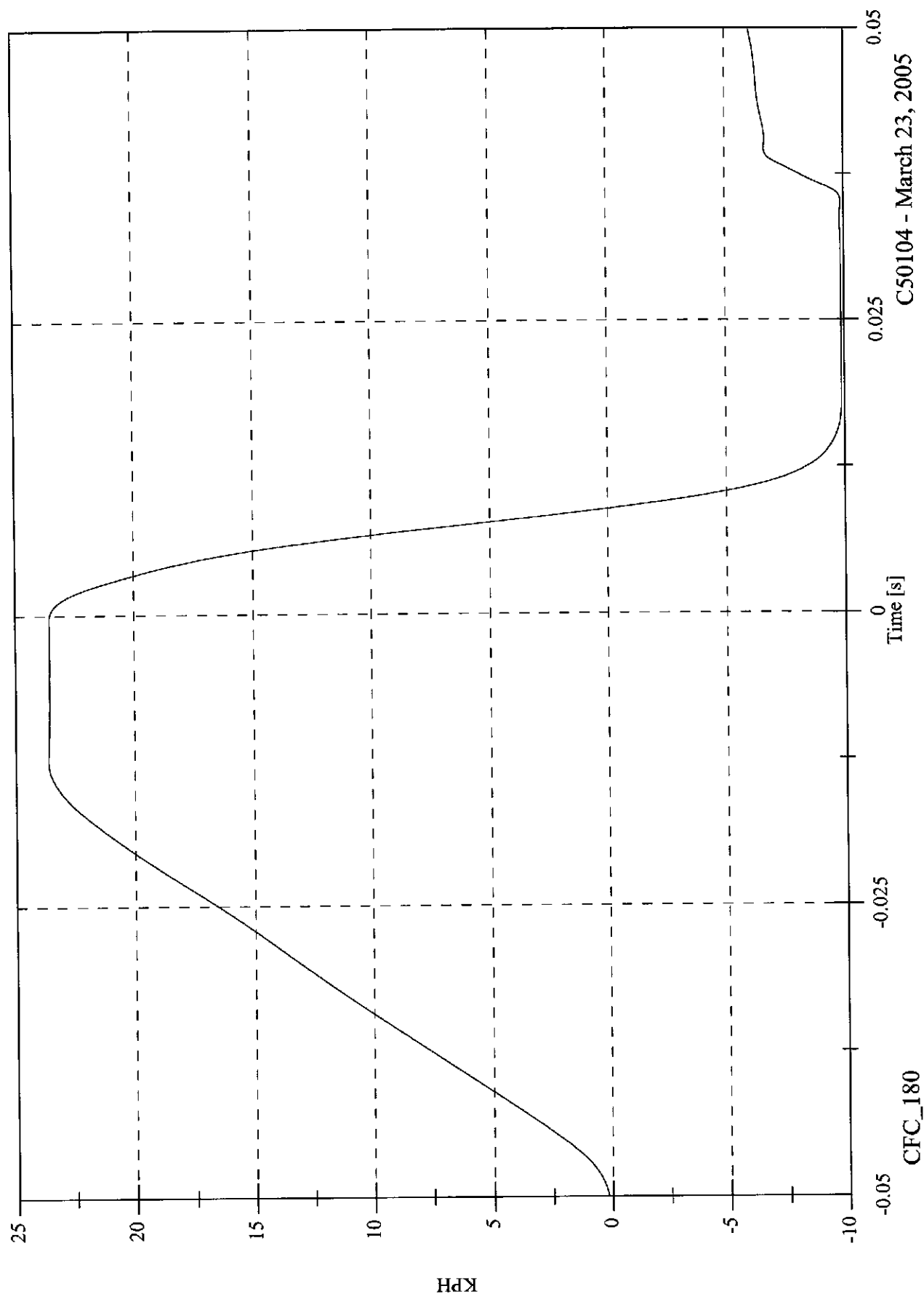


C50104 - March 23, 2005

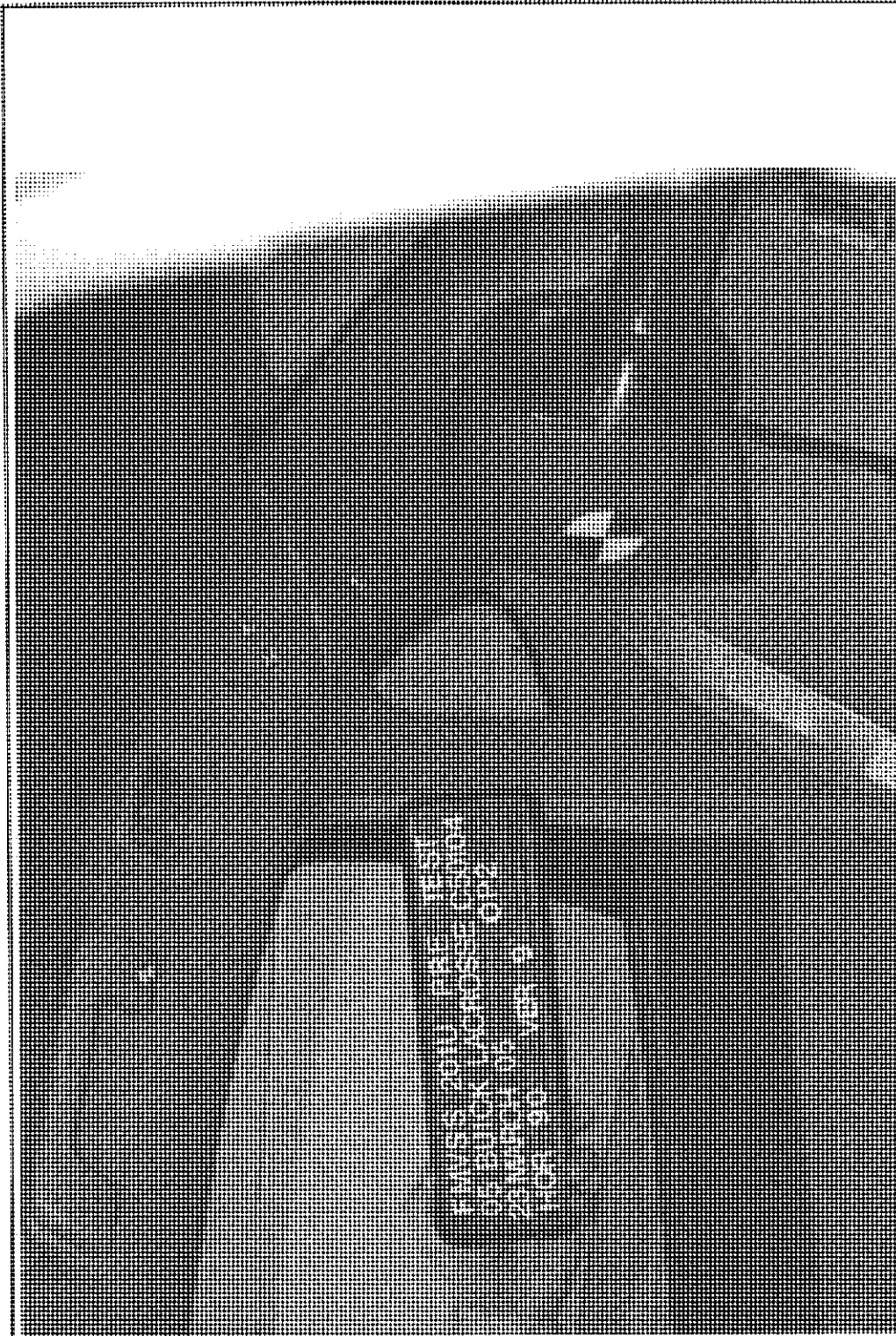
Max: 23.6 [KPH] at -0.012 [s]
Min: -9.9 [KPH] at 0.019 [s]

FMVSS 201U IMPACT TEST - 2005 Buick Lacrosse Sedan

Headform Velocity

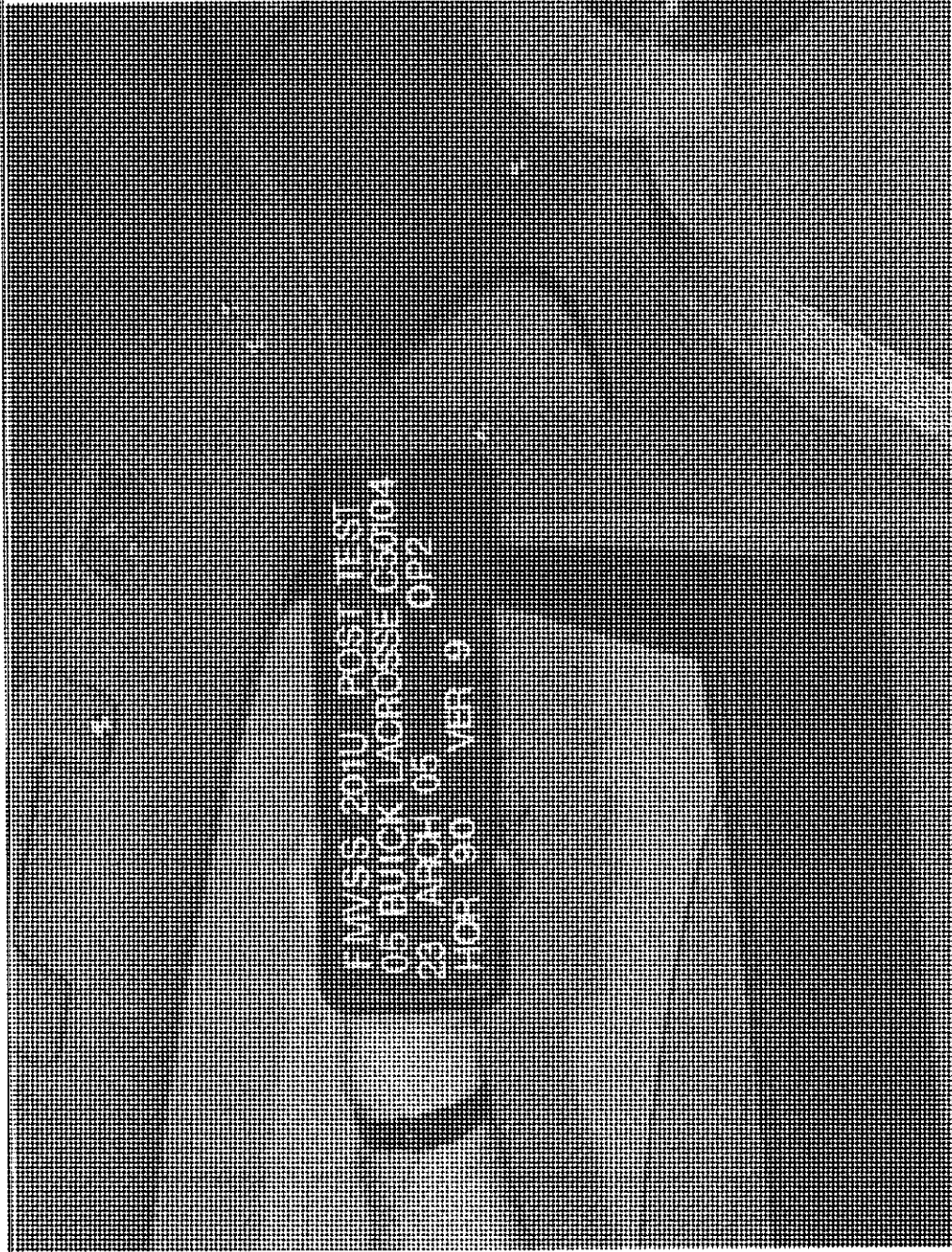


C50104 - March 23, 2005



FWES 2011 PRE-IMPACT
14.000000000000000
20.000000000000000
14.000000000000000
20.000000000000000
14.000000000000000
20.000000000000000

PRE-IMPACT OP2



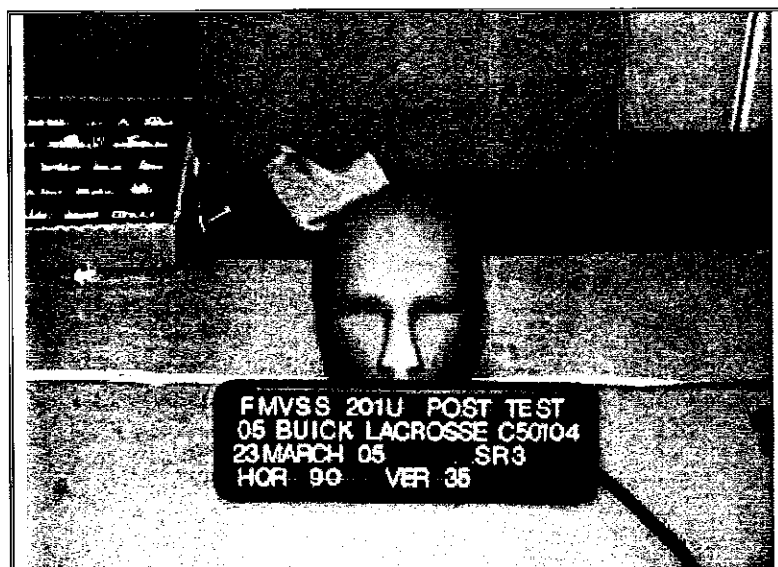
FMVSS 2010 POST TEST
05 BUICK LACROSSE C50104
25 APR 05
HOR 90 VER 9

POST-IMPACT 072

VEHICLE YEAR/MAKE/MODEL/STYLE:	2005 Buick LaCrosse 4-Door Sedan
VIN:	2G4WC532451200267
DATE OF MANUFACTURE:	10/04(SEE CERTIFICATION LABEL)
COLOR:	Red

Test Number:	02
Test Date:	03/23/05
Target Location:	Side Rail
Target Code:	SR3
Horizontal Impact Angle:	90°
Vertical Impact Angle:	35°
Ambient Temperature:	24.3C°
Relative Humidity:	13.9
Time of Impact:	9:50
Headform Number:	355

Impact Point Description (from lower midpoint on midsagittal line)			
On Centerline	6	<input type="checkbox"/> mm right	<input checked="" type="checkbox"/> mm left
On Centerline	14	mm up	



POST-IMPACT SR3 HEADFORM

Free Motion HIC	781
HIC(d)	755.6
Impact Velocity (kph)	23.36
HIC T1 (msec)	2.9
HIC T2 (msec)	8.8

FMVSS 201U IMPACT TEST - 2005 Buick Lacrosse C50104 - SR3

FMH Headform 355

Location: SR3

Test Date: March 23, 2005

Work File: SR3

-----TEST RESULTS-----

Lab Temperature: 24.3 C

HICd: 755.6

Lab Humidity: 13.9 %

HIC (36ms): 781.0

Velocity at Impact: 23.36 KPH

t1: 2.9 msec

t2: 8.8 msec

Free Flight Distance: 219.36 mm

Duration: 6.0 msec

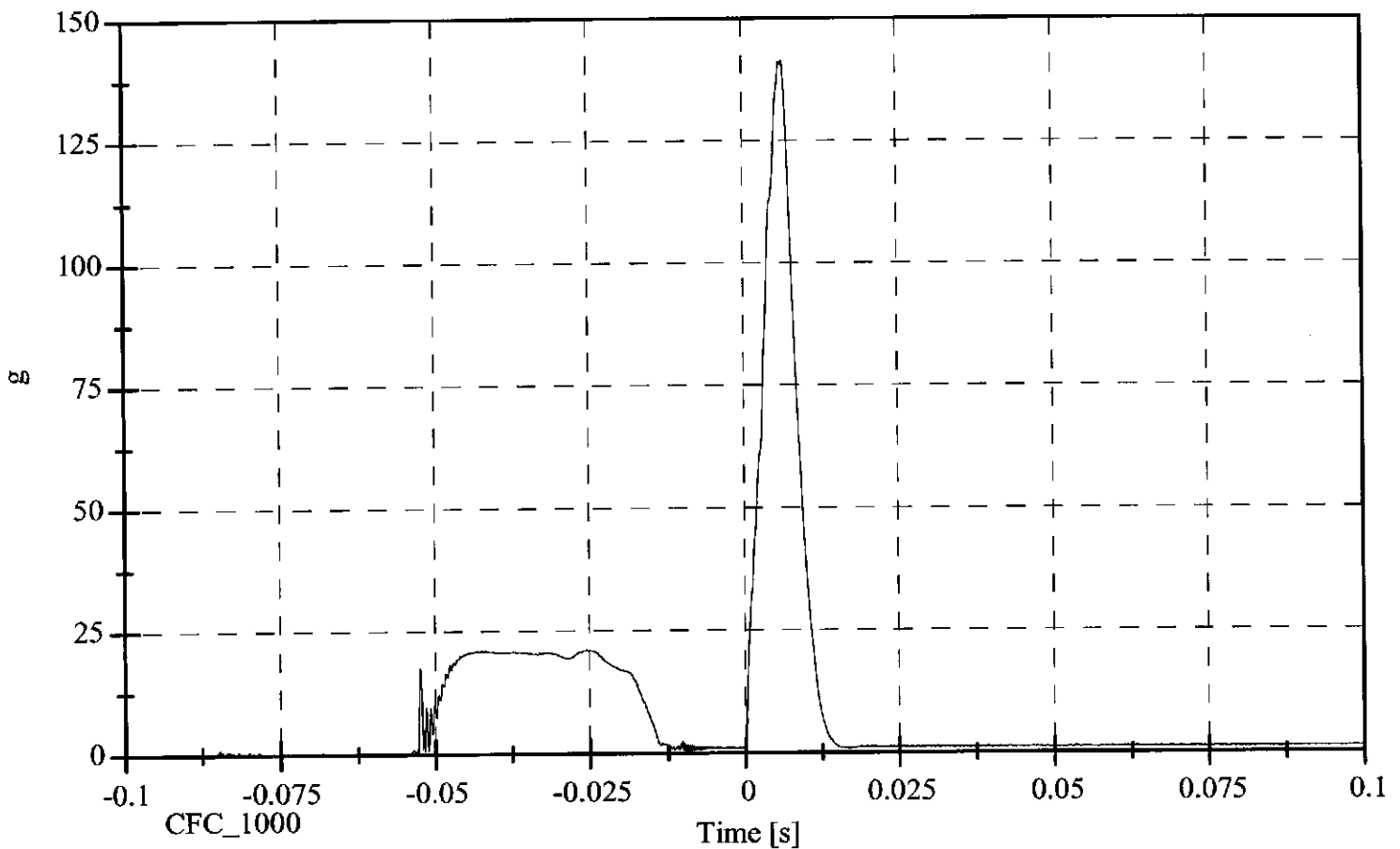
Maximum: 141.4 g

Average Acceleration: 8.5 g

FMVSS 201U IMPACT TEST - 2005 Buick Lacrosse
Headform Resultant

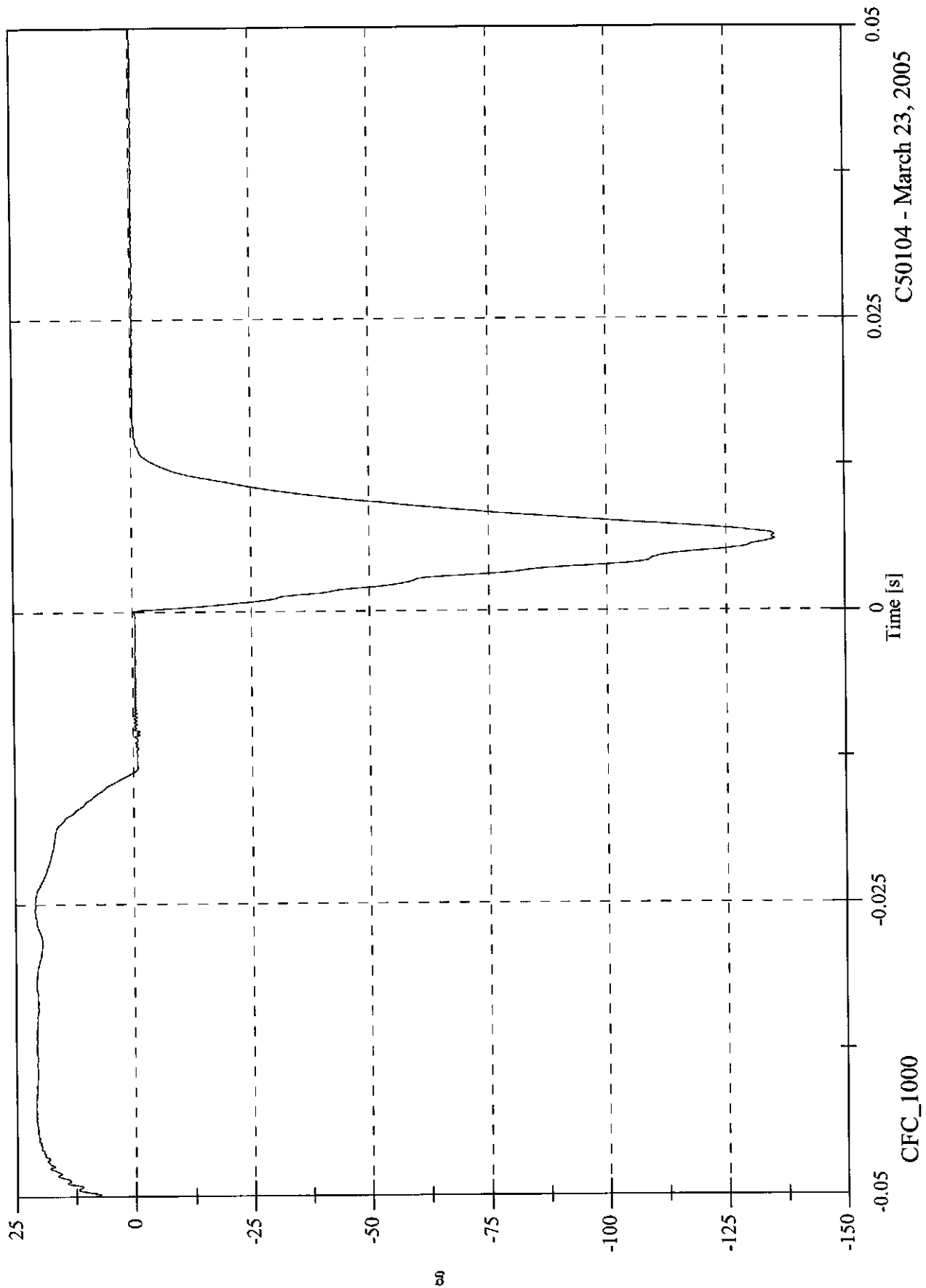
Max: 141.4 [g] at 0.006 [s]

Min: 0.0 [g] at -0.097 [s]



Max: 21.0 [g] at -0.026 [s]
Min: -135.2 [g] at 0.006 [s]

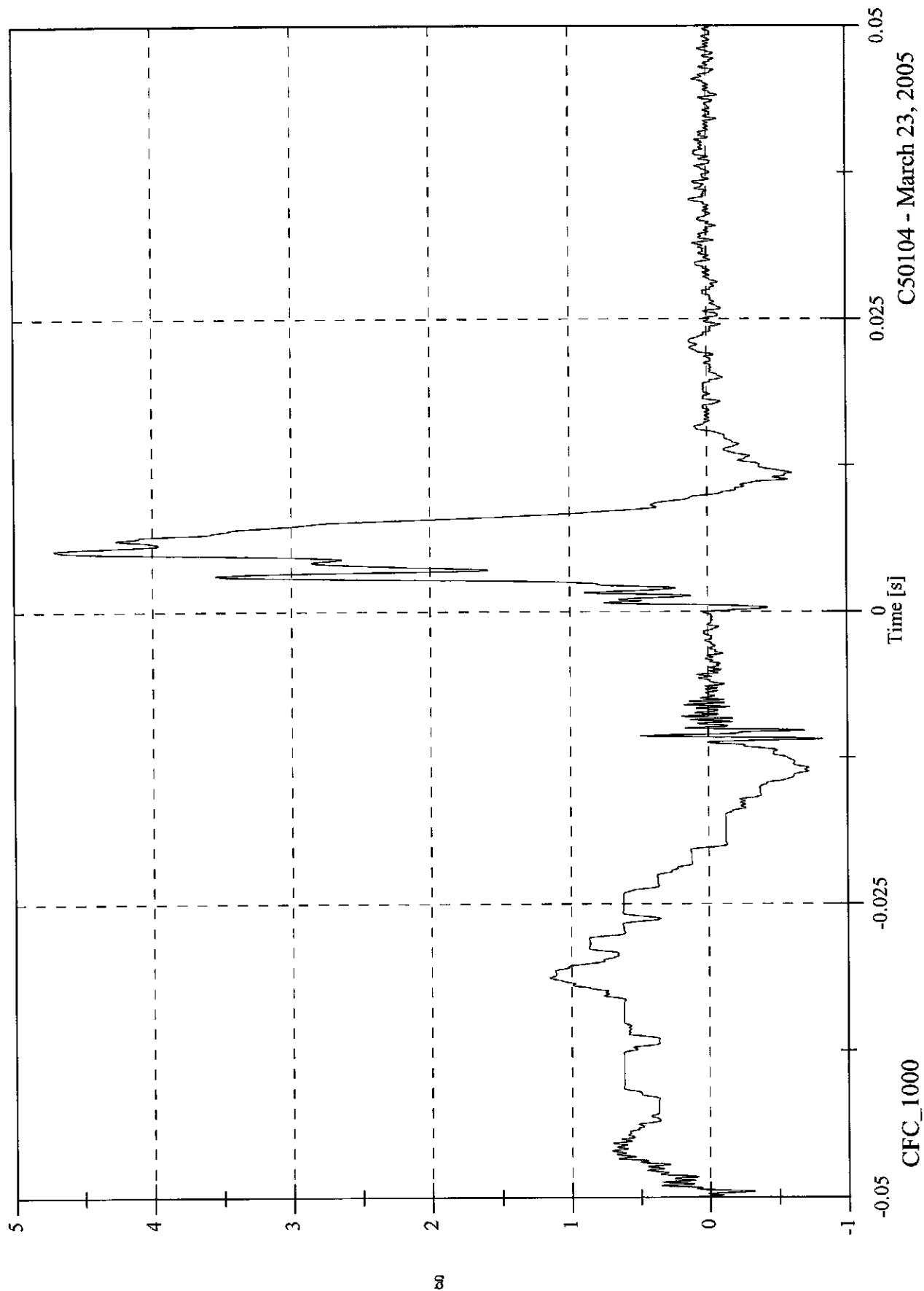
FMVSS 201U IMPACT TEST - 2005 Buick Lacrosse
Headform X Acceleration



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FMVSS 201U IMPACT TEST - 2005 Buick Lacrosse
Headform Y Acceleration

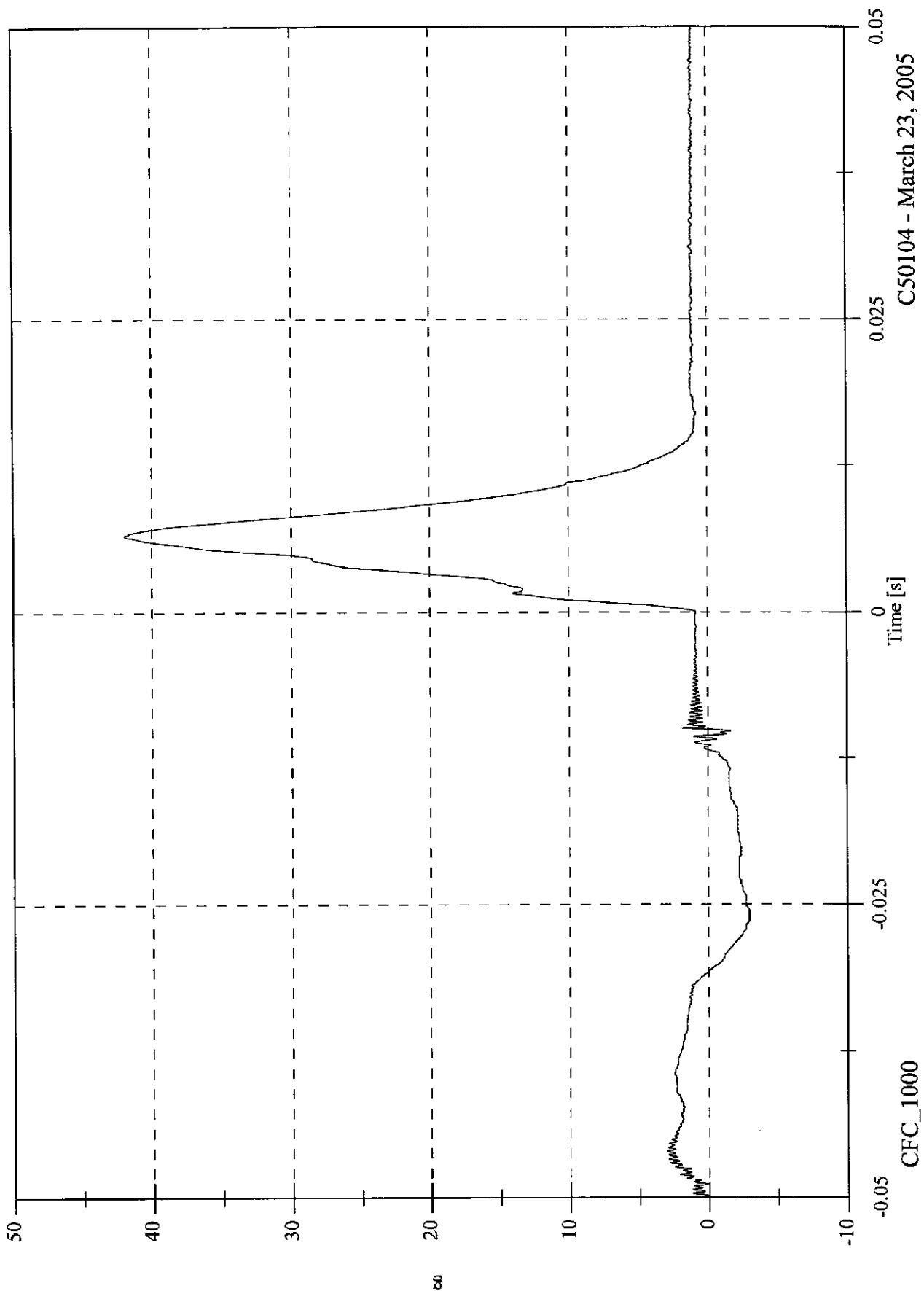
Max: 4.7 [g] at 0.005 [s]
Min: -0.8 [g] at -0.011 [s]



C50104 - March 23, 2005

FMVSS 201U IMPACT TEST - 2005 Buick Lacrosse
Headform Z Acceleration

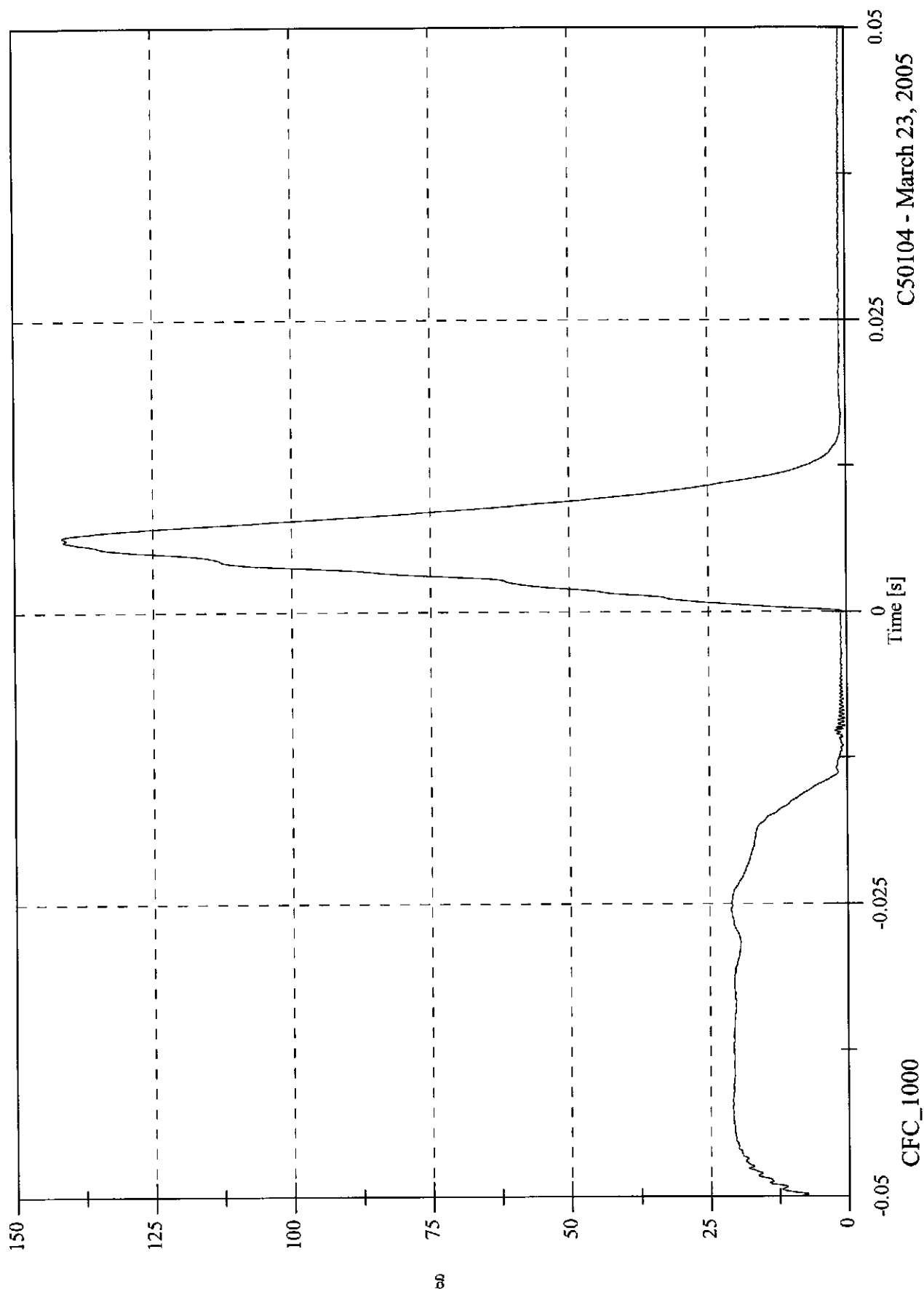
Max: 42.0 [g] at 0.007 [s]
Min: -3.0 [g] at -0.026 [s]



Max: 141.4 [g] at 0.006 [s]
Min: 0.4 [g] at -0.010 [s]

FMVSS 201U IMPACT TEST - 2005 Buick Lacrosse

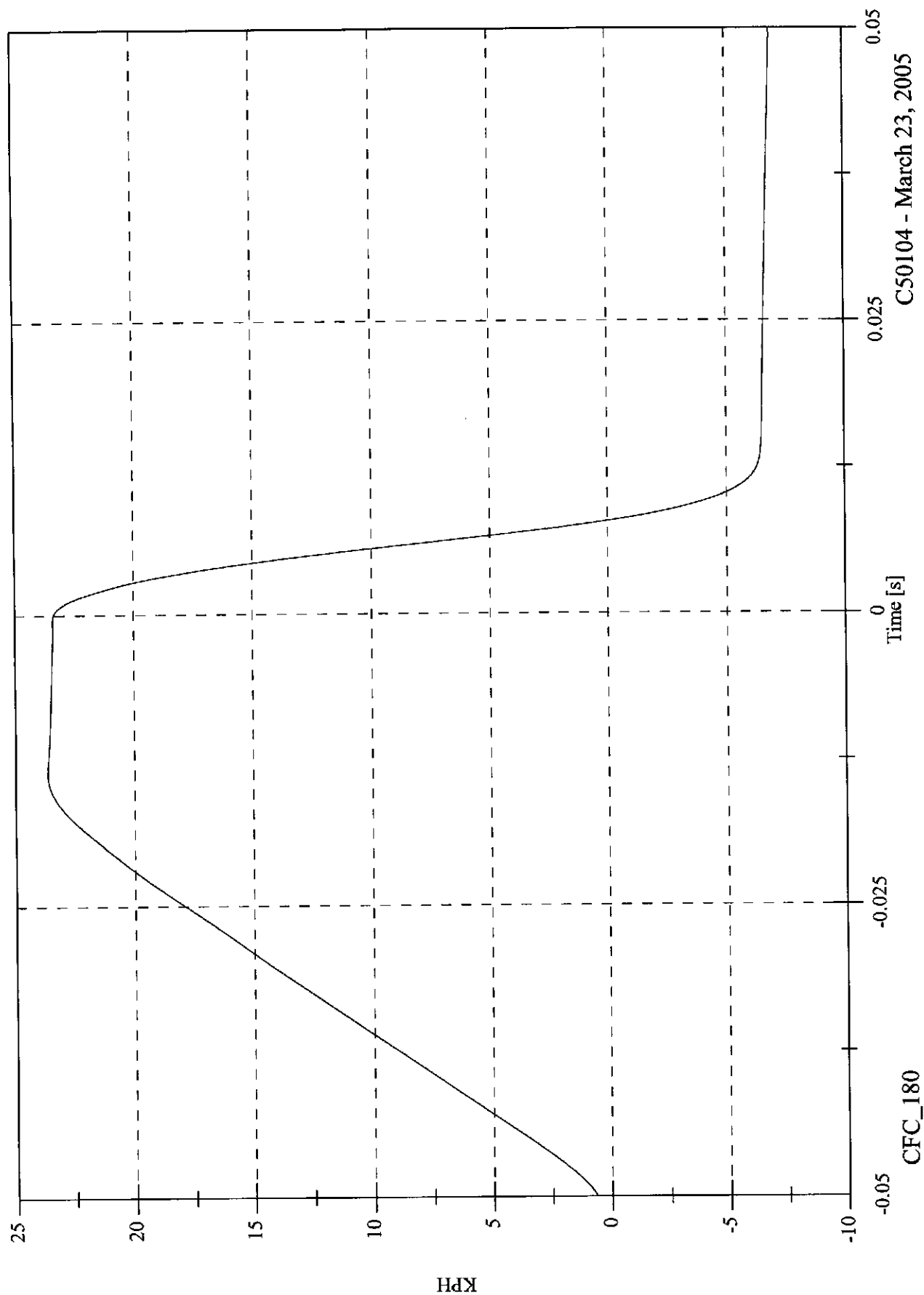
Headform Resultant



Max: 23.6 [KPH] at -0.014 [s]
Min: -6.9 [KPH] at 0.050 [s]

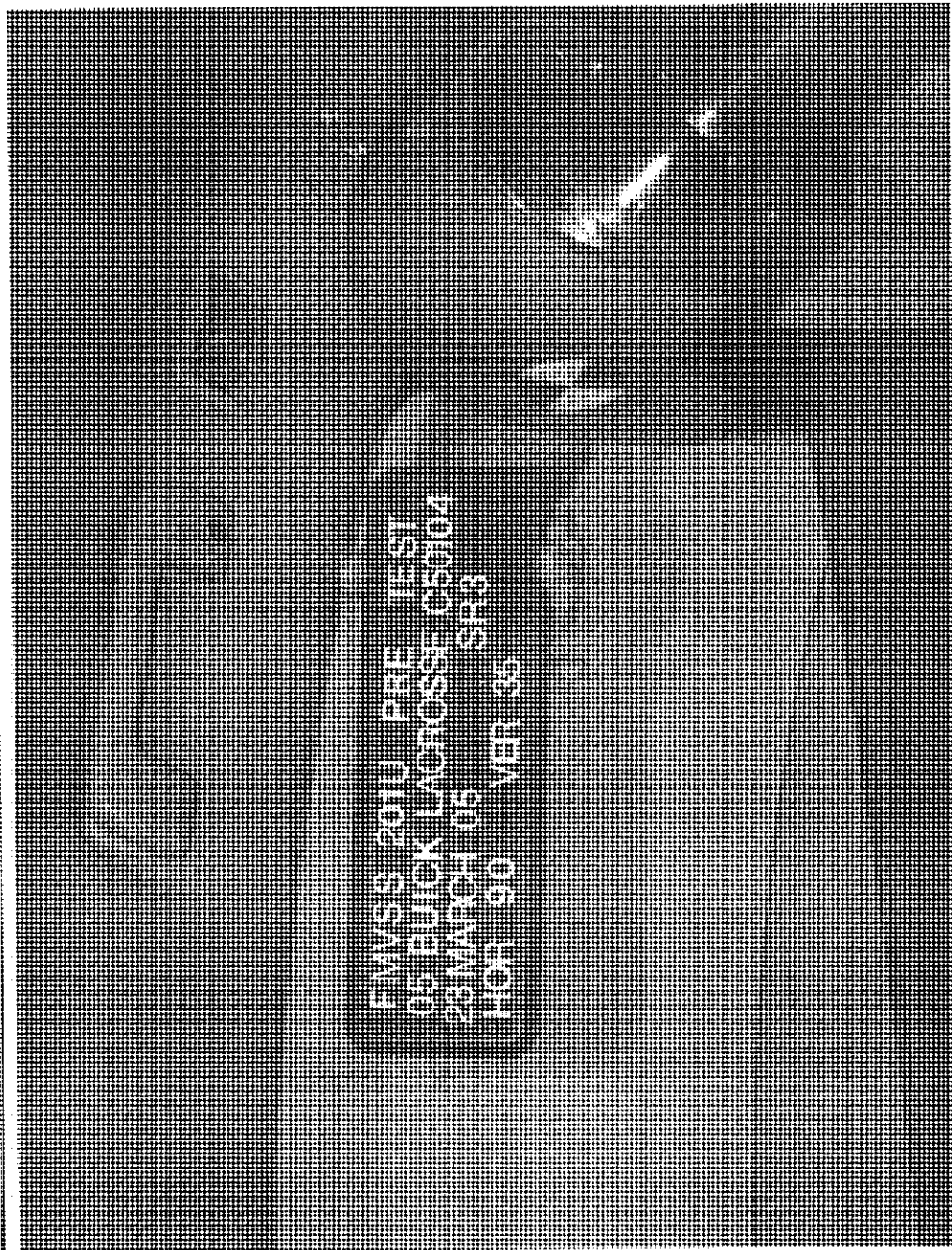
FMVSS 201U IMPACT TEST - 2005 Buick Lacrosse

Headform Velocity



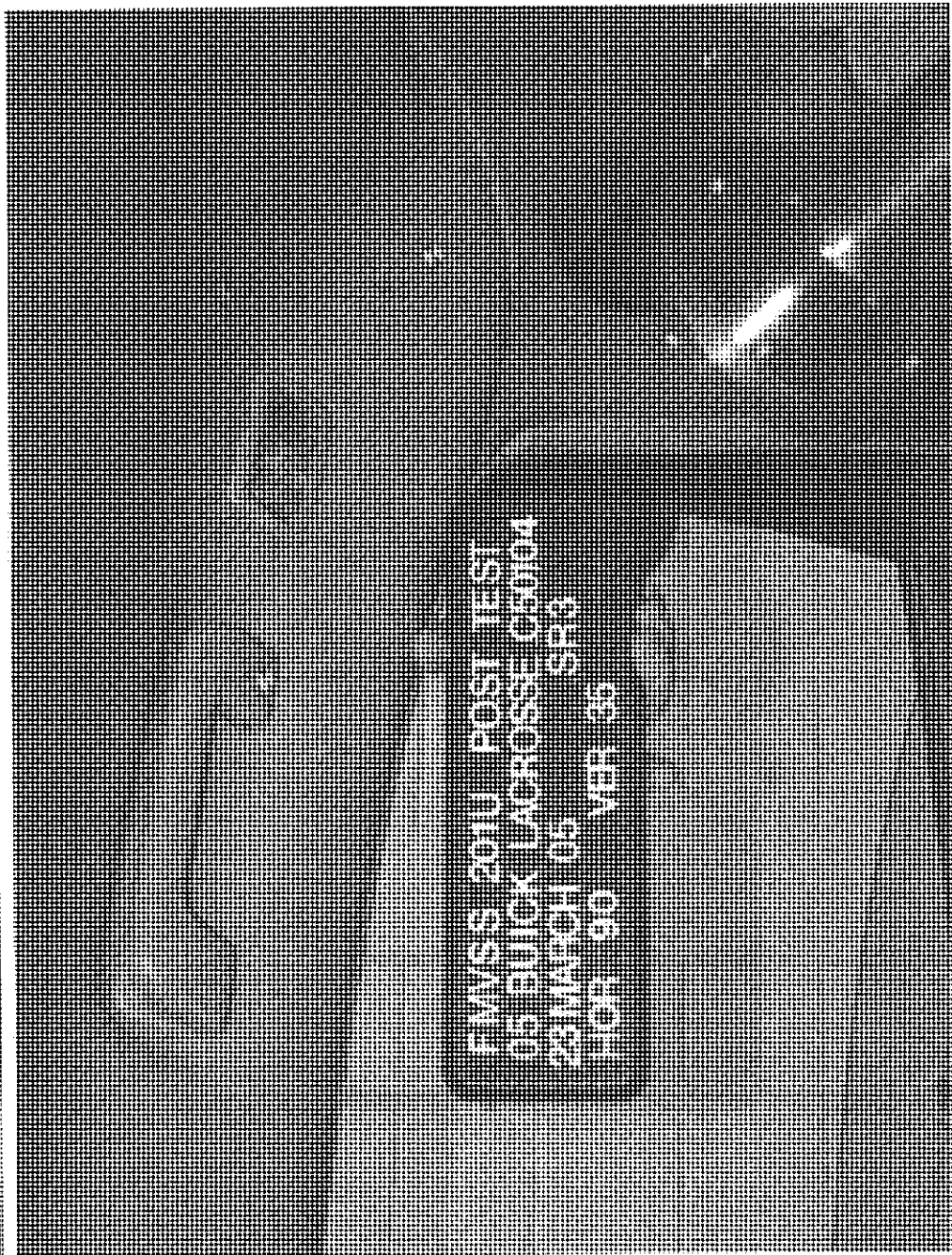
CFC_180

C50104 - March 23, 2005



PRE-IMPACT SR3

8754.FMH-04



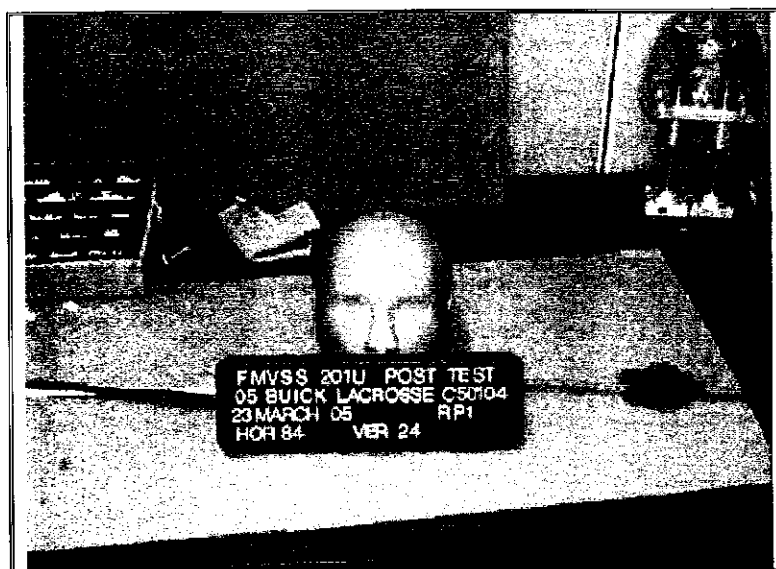
POST-IMPACT SR3

8754.FMH-05

VEHICLE YEAR/MAKE/MODEL/STYLE:	2005 Buick LaCrosse 4-Door Sedan
VIN:	2G4WC532451200267
DATE OF MANUFACTURE:	10/04(SEE CERTIFICATION LABEL)
COLOR:	Red

Test Number:	03
Test Date:	03/23/05
Target Location:	Rear Pillar
Target Code:	RP1
Horizontal Impact Angle:	84°
Vertical Impact Angle:	24°
Ambient Temperature:	24.5C°
Relative Humidity:	14.2
Time of Impact:	10:25
Headform Number:	805

Impact Point Description (from lower midpoint on midsagittal line)			
On Centerline	15	<input type="checkbox"/> mm right	<input checked="" type="checkbox"/> mm left
On Centerline	10	mm up	



POST-IMPACT RP1 HEADFORM

Free Motion HIC	775.5
HIC(d)	751.5
Impact Velocity (kph)	23.66
HIC T1 (msec)	1.6
HIC T2 (msec)	7.7

FMVSS 201U IMPACT TEST - 2005 Buick Lacrosse C50104 - RP1

FMH Headform 805

Location: RP1

Test Date: March 23, 2005

Work File: RP1

-----TEST RESULTS-----

Lab Temperature: 24.5 C

HICd: 751.5

Lab Humidity: 14.2 %

HIC (36ms): 775.5

Velocity at Impact: 23.66 KPH

t1: 1.6 msec

t2: 7.7 msec

Free Flight Distance: 212.75 mm

Duration: 6.1 msec

Maximum: 146.5 g

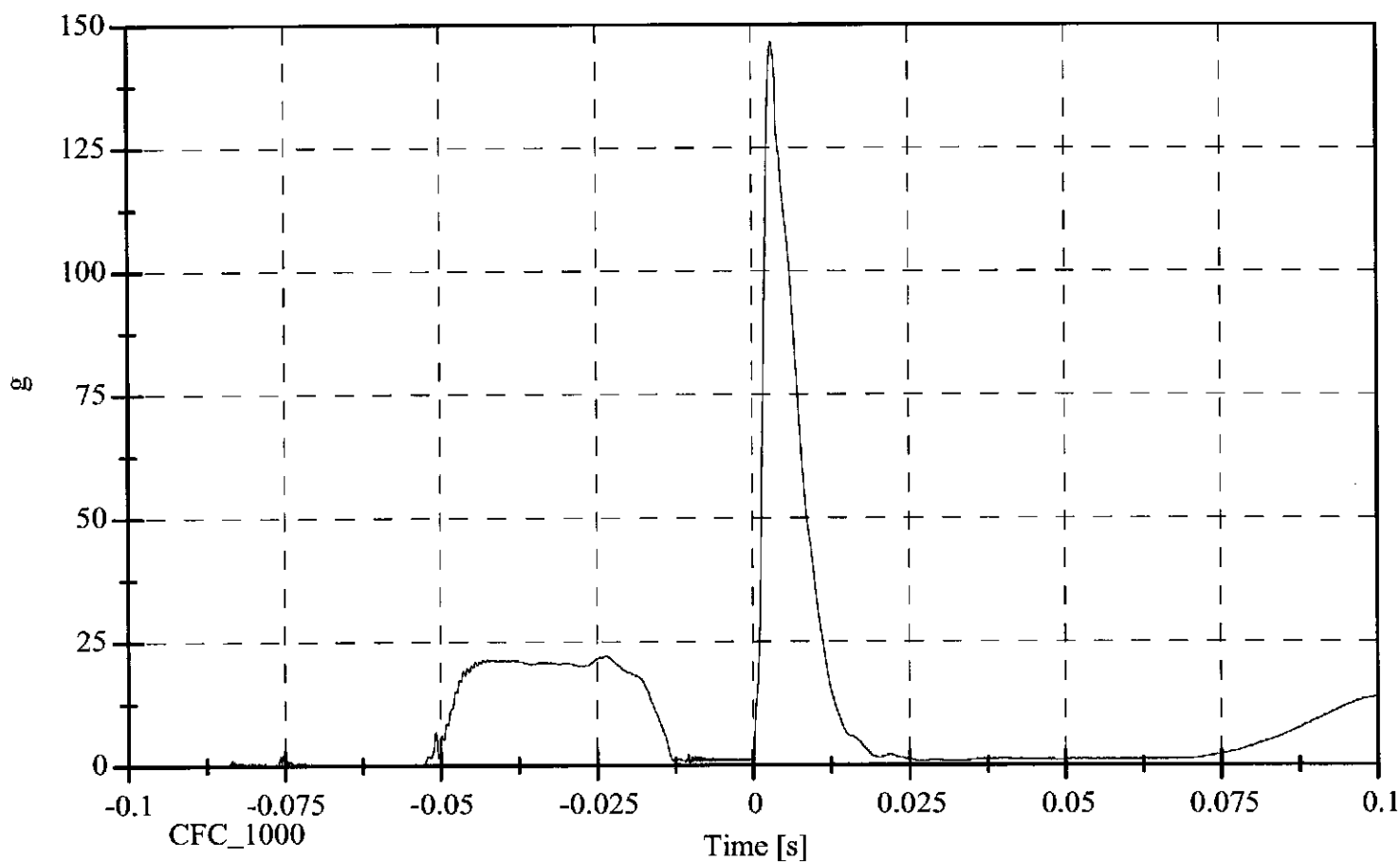
Average Acceleration: 9.5 g

FMVSS 201U IMPACT TEST - 2005 Buick Lacrosse

Max: 146.5 [g] at 0.003 [s]

Headform Resultant

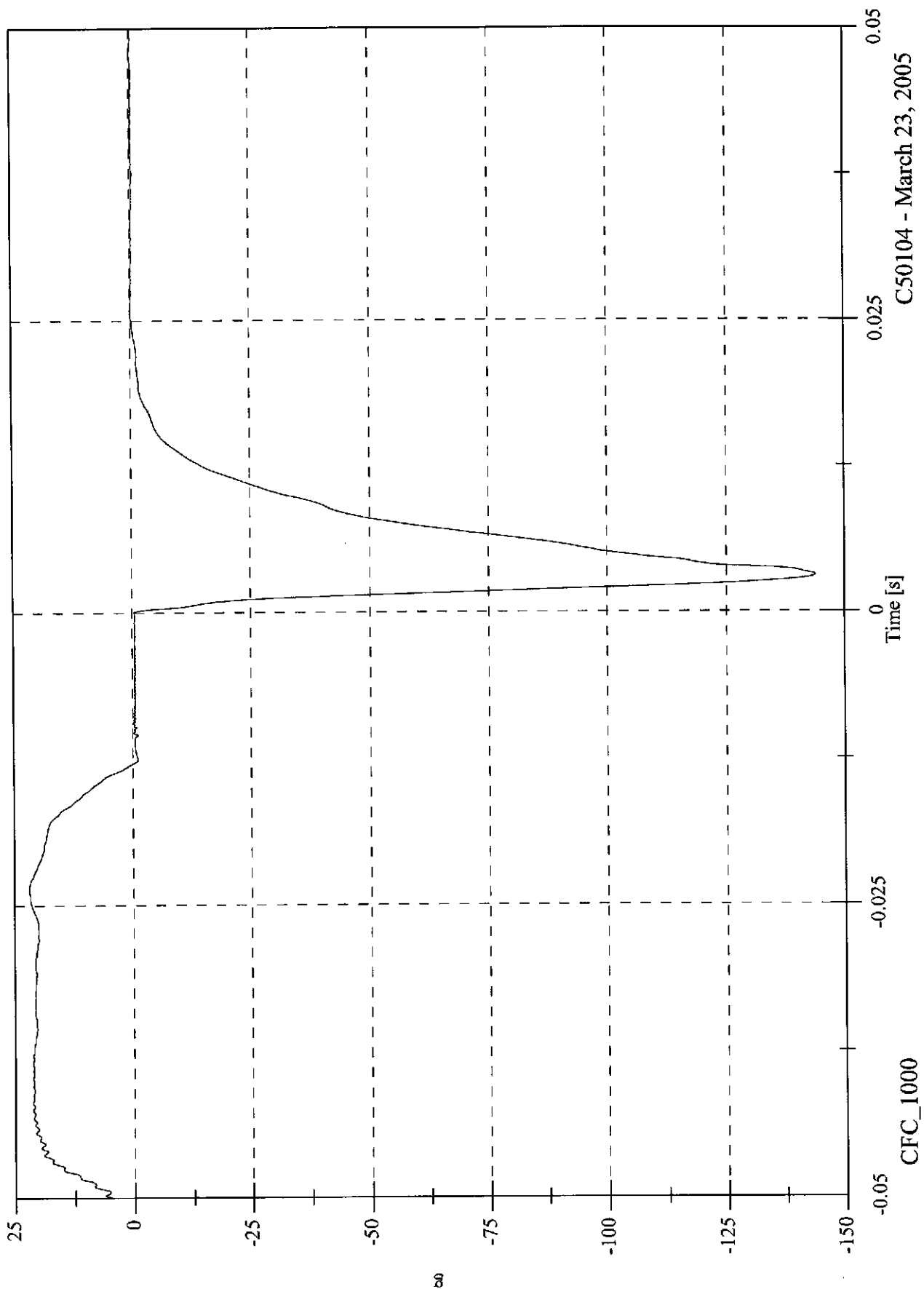
Min: 0.0 [g] at -0.097 [s]



FMVSS 201U IMPACT TEST - 2005 Buick Lacrosse

Headform X Acceleration

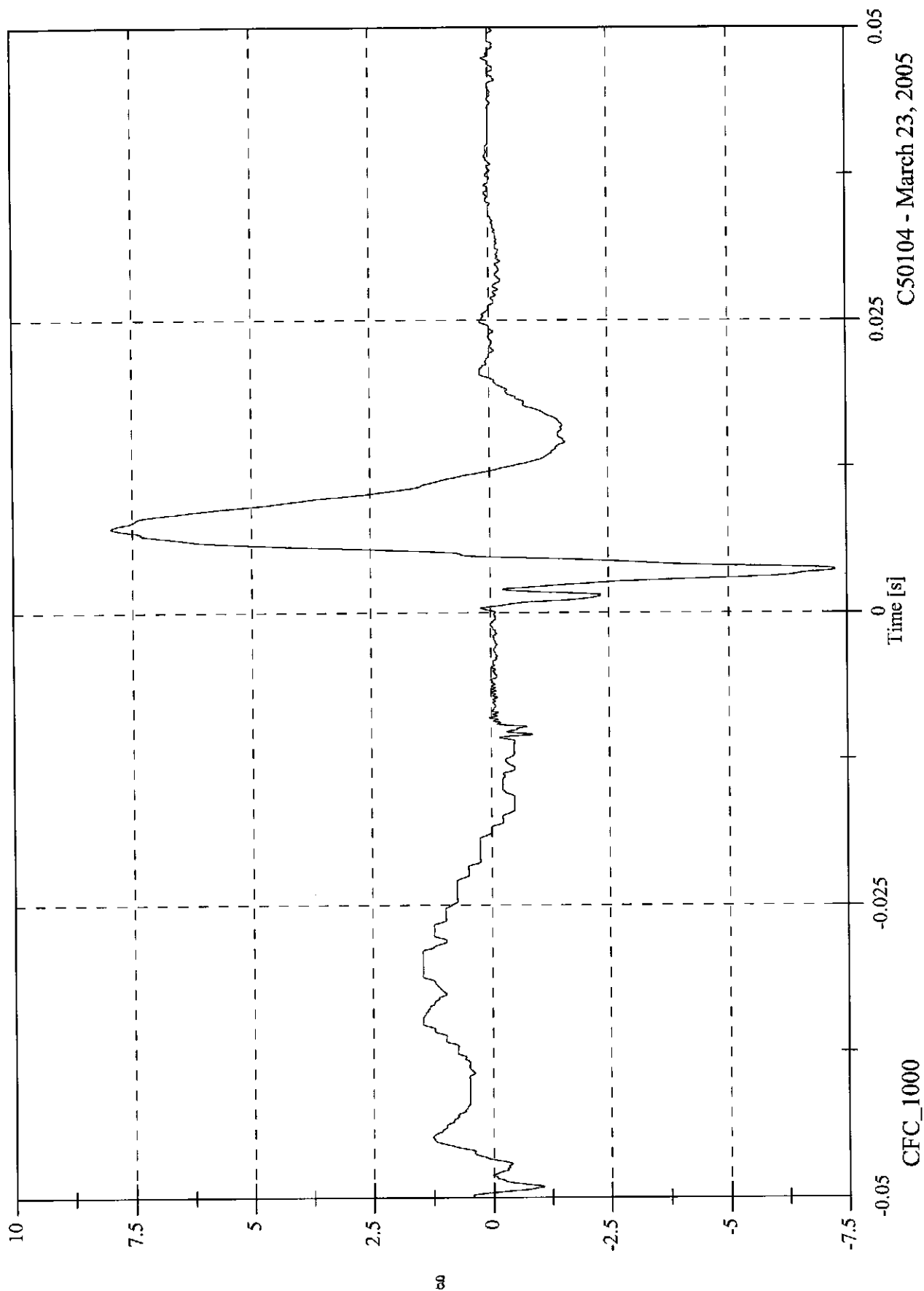
Max: 21.9 [g] at -0.024 [s]
Min: -143.8 [g] at 0.003 [s]



C50104 - March 23, 2005

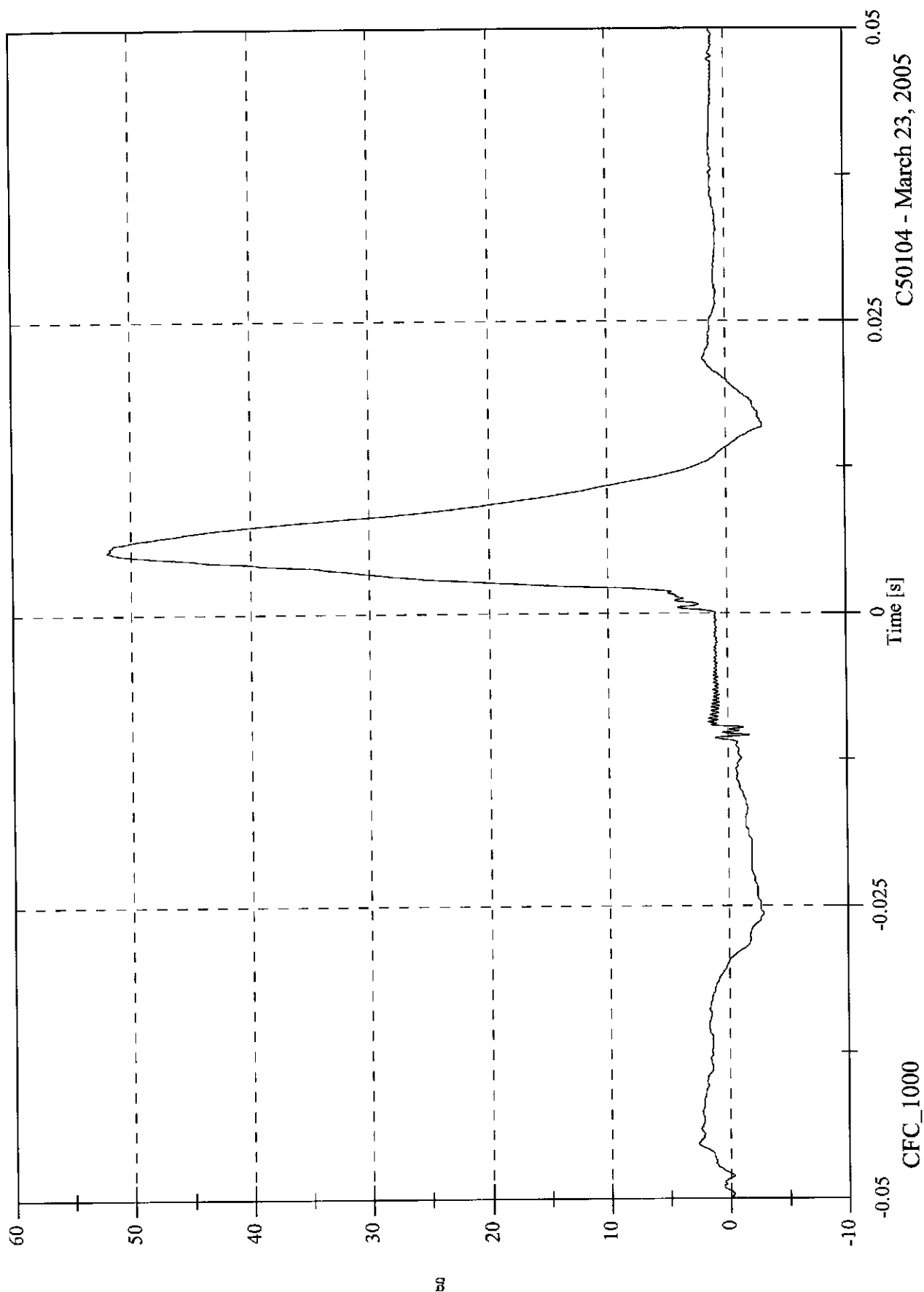
Max: 7.9 [g] at 0.007 [s]
Min: -7.3 [g] at 0.004 [s]

FMVSS 201U IMPACT TEST - 2005 Buick Lacrosse
Headform Y Acceleration



FMVSS 201U IMPACT TEST - 2005 Buick Lacrosse
Headform Z Acceleration

Max: 52.0 [g] at 0.005 [s]
Min: -3.1 [g] at 0.016 [s]

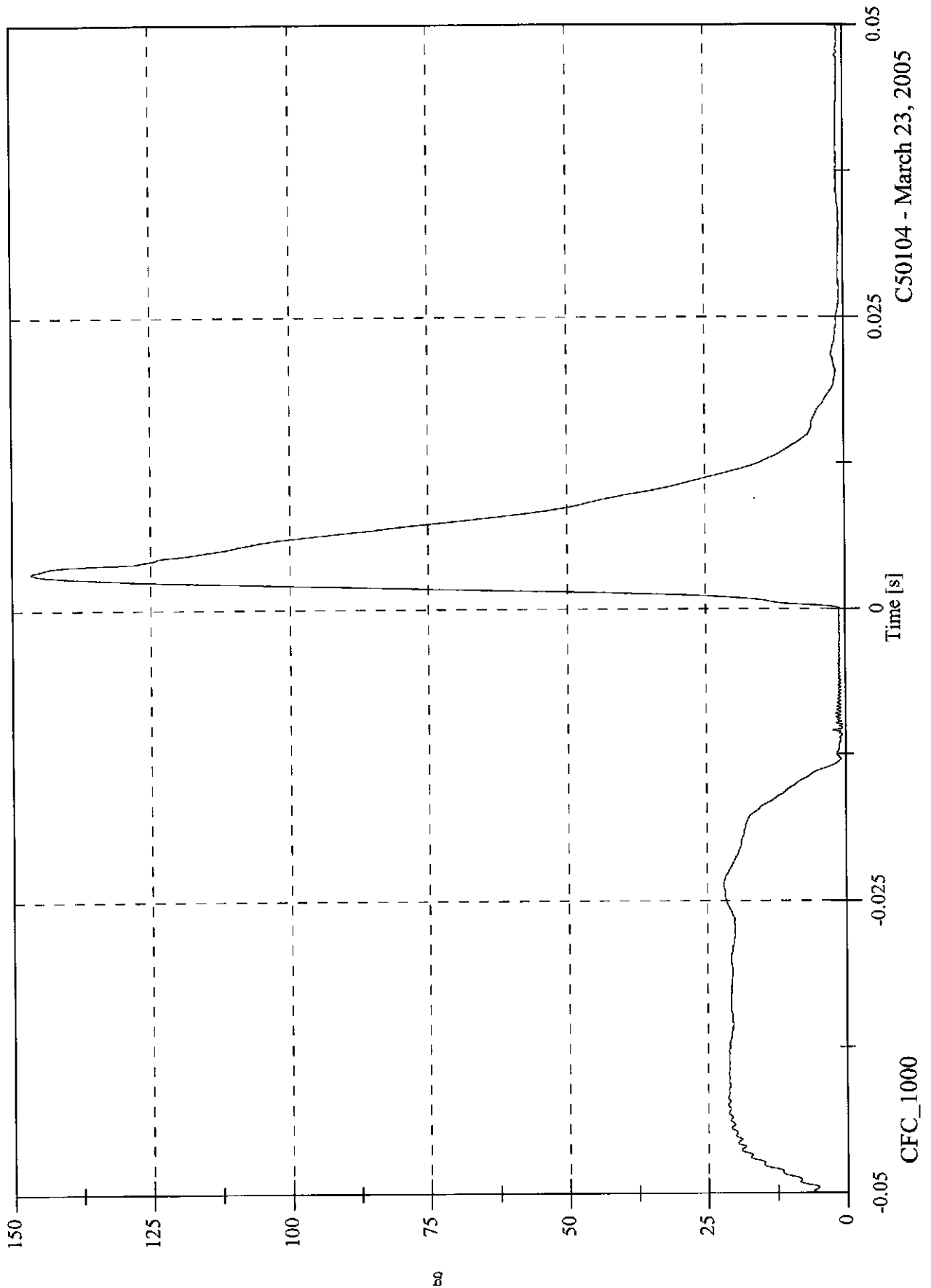


C50104 - March 23, 2005

FMVSS 201U IMPACT TEST - 2005 Buick Lacrosse

Max: 146.5 [g] at 0.003 [s]
Min: 0.6 [g] at -0.010 [s]

Headform Resultant



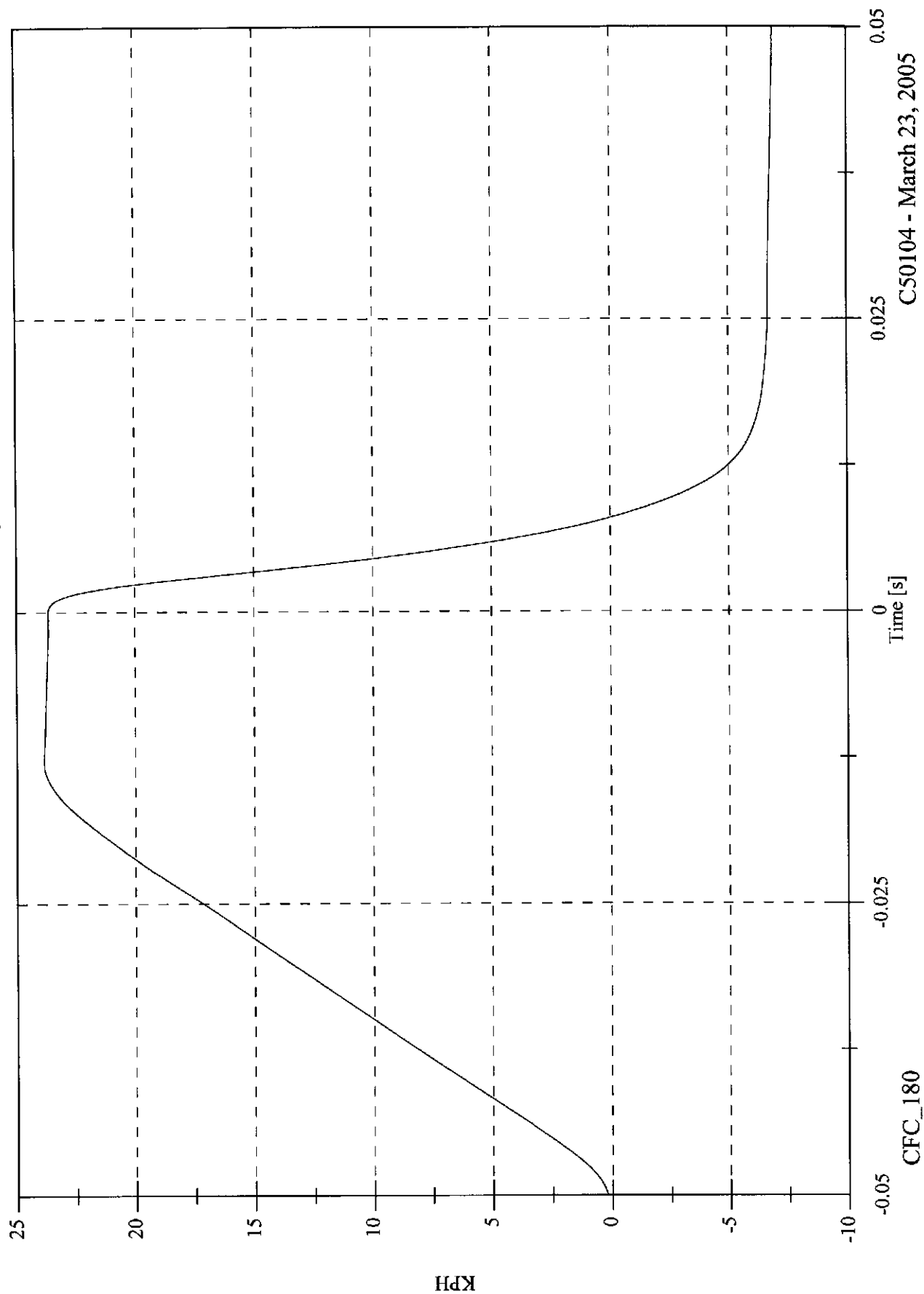
FMVSS 201U IMPACT TEST - 2005 Buick Lacrosse

Headform Velocity

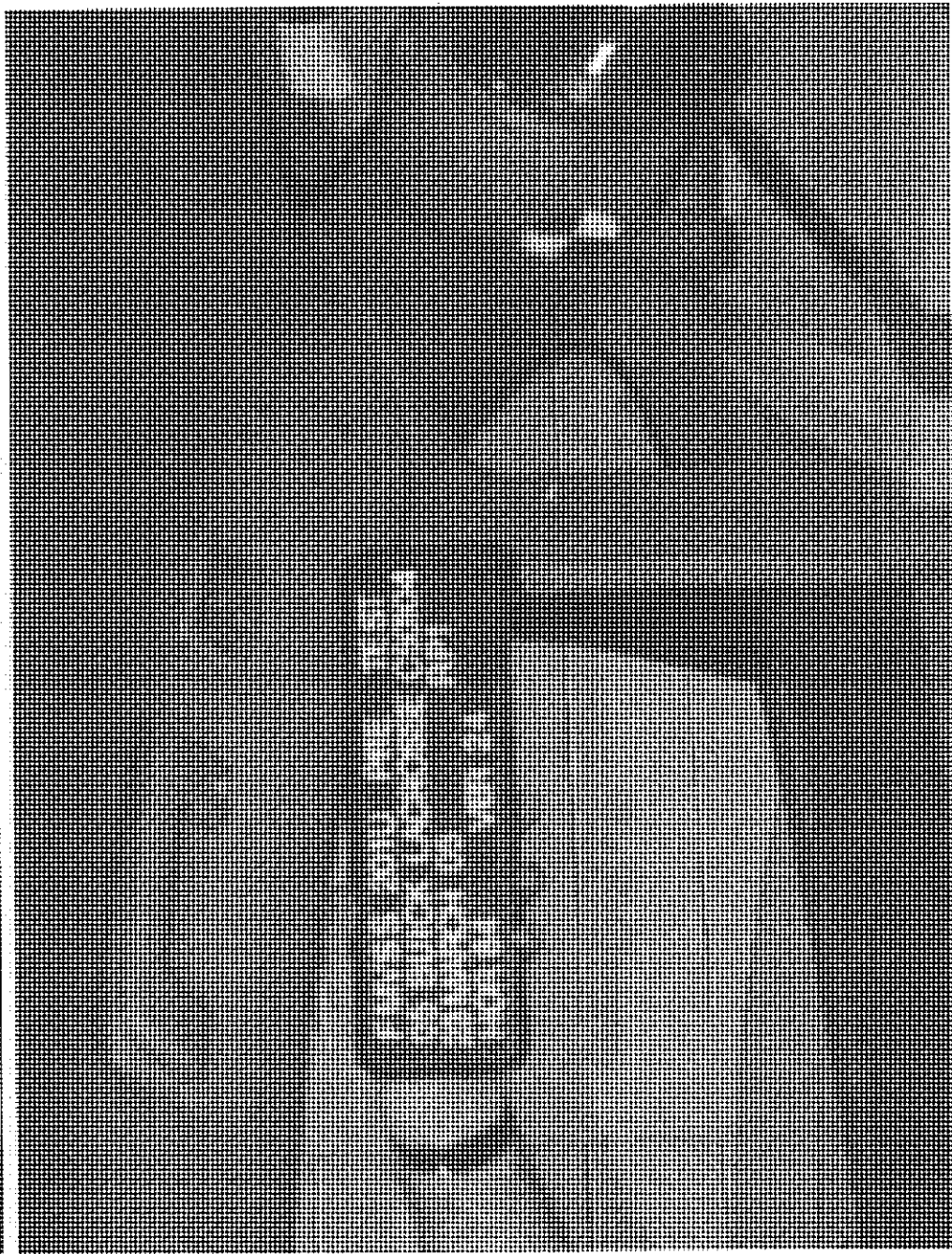
Max: 23.9 [KPH] at -0.013 [s]

Min: -6.9 [KPH] at 0.050 [s]

Time [s]

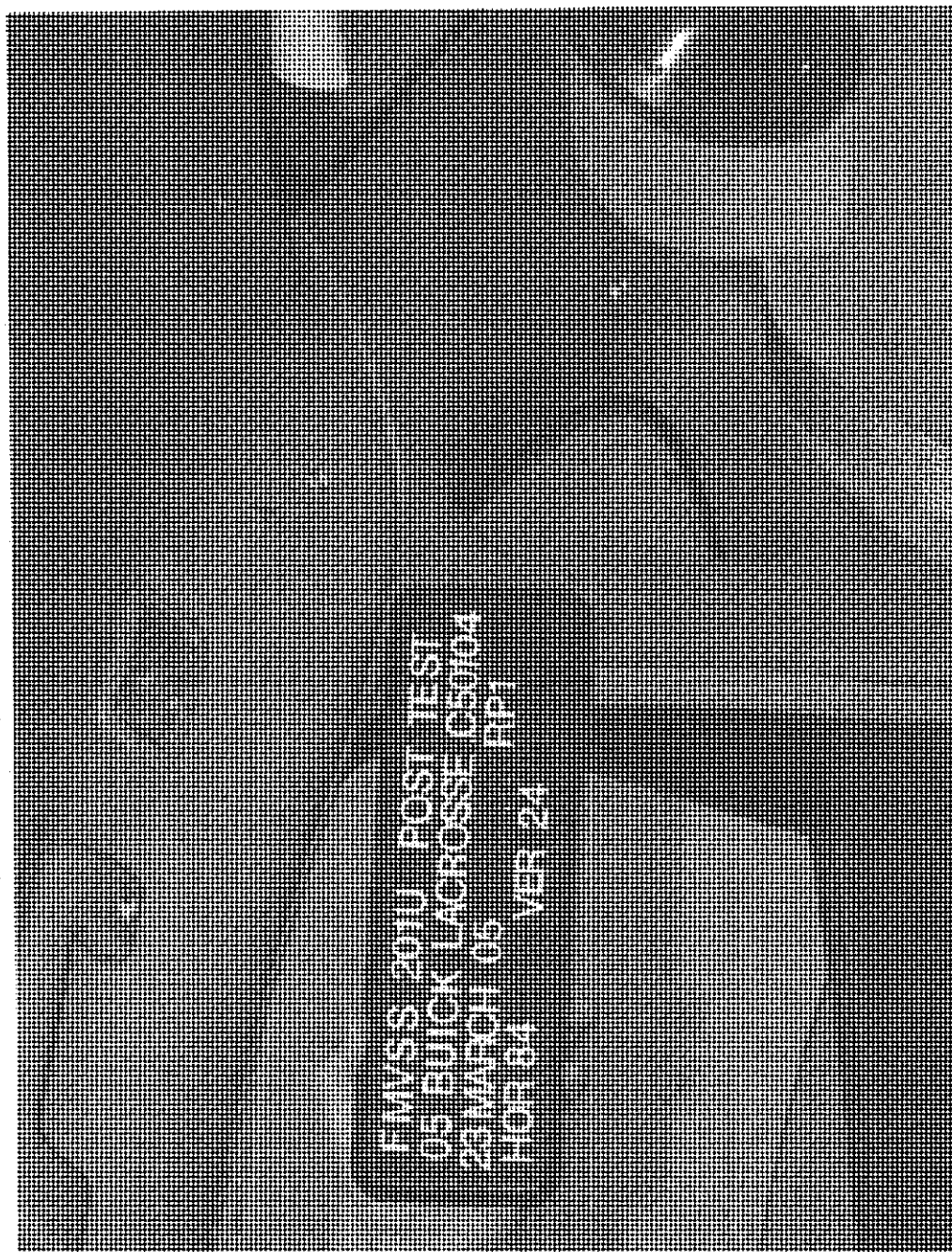


C50104 - March 23, 2005



PRE-IMPACT

8754-FMH-04



FMVSS 201U POST TEST
05 BUICK LACROSSE C50004
23 MARCH 05 RPT
HOF 84 VER 24

POST-IMPACT RPT

8/94 FMH-03

VEHICLE YEAR/MAKE/MODEL/STYLE:	2005 Buick LaCrosse 4-Door Sedan
VIN:	2G4WC532451200267
DATE OF MANUFACTURE:	10/04(SEE CERTIFICATION LABEL)
COLOR:	Red

Test Number:	04
Test Date:	03/23/05
Target Location:	B-Pillar
Target Code:	BP3
Horizontal Impact Angle:	90°
Vertical Impact Angle:	-4°
Ambient Temperature:	23.8C°
Relative Humidity:	13.8
Time of Impact:	10:45
Headform Number:	1255

Impact Point Description (from lower midpoint on midsagittal line)			
On Centerline	45	<input checked="" type="checkbox"/> mm right	<input type="checkbox"/> mm left
On Centerline	10	mm up	



POST-IMPACT BP3 HEADFORM

Free Motion HIC	350.1
HIC(d)	430.5
Impact Velocity (kph)	23.64
HIC T1 (msec)	2.6
HIC T2 (msec)	12.5

FMVSS 201U IMPACT TEST - 2005 Buick Lacrosse C50104 - BP3

FMH Headform 1255

Location: BP3

Test Date: March 23, 2005

Work File: BP3

-----TEST RESULTS-----

Lab Temperature: 23.8 C

HICd: 430.5

Lab Humidity: 13.8 %

HIC (36ms): 350.1

Velocity at Impact: 23.64 KPH

t1: 2.6 msec

t2: 12.5 msec

Free Flight Distance: 212.45 mm

Duration: 9.9 msec

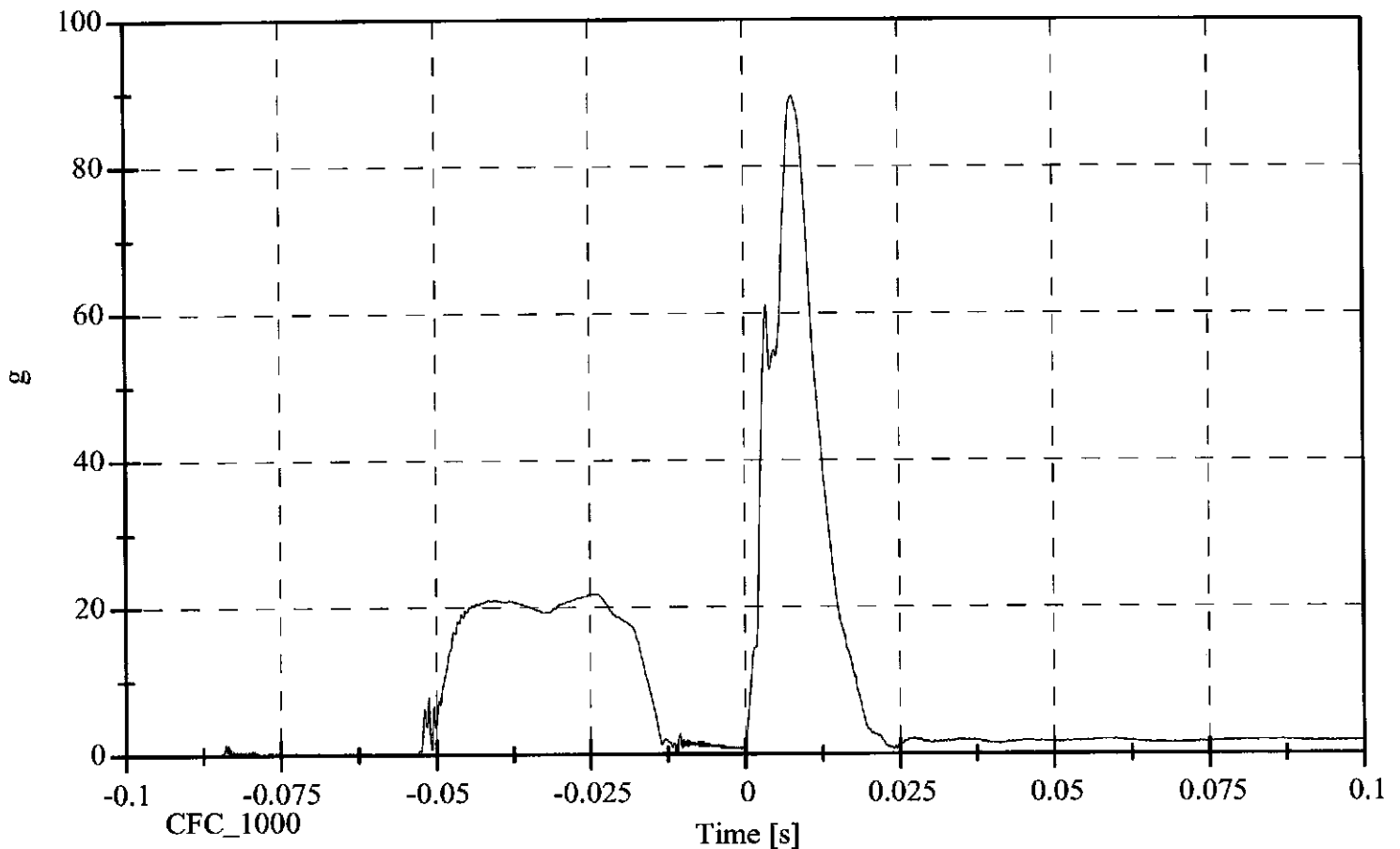
Maximum: 89.6 g

Average Acceleration: 8.3 g

FMVSS 201U IMPACT TEST - 2005 Buick Lacrosse
Headform Resultant

Max: 89.6 [g] at 0.008 [s]

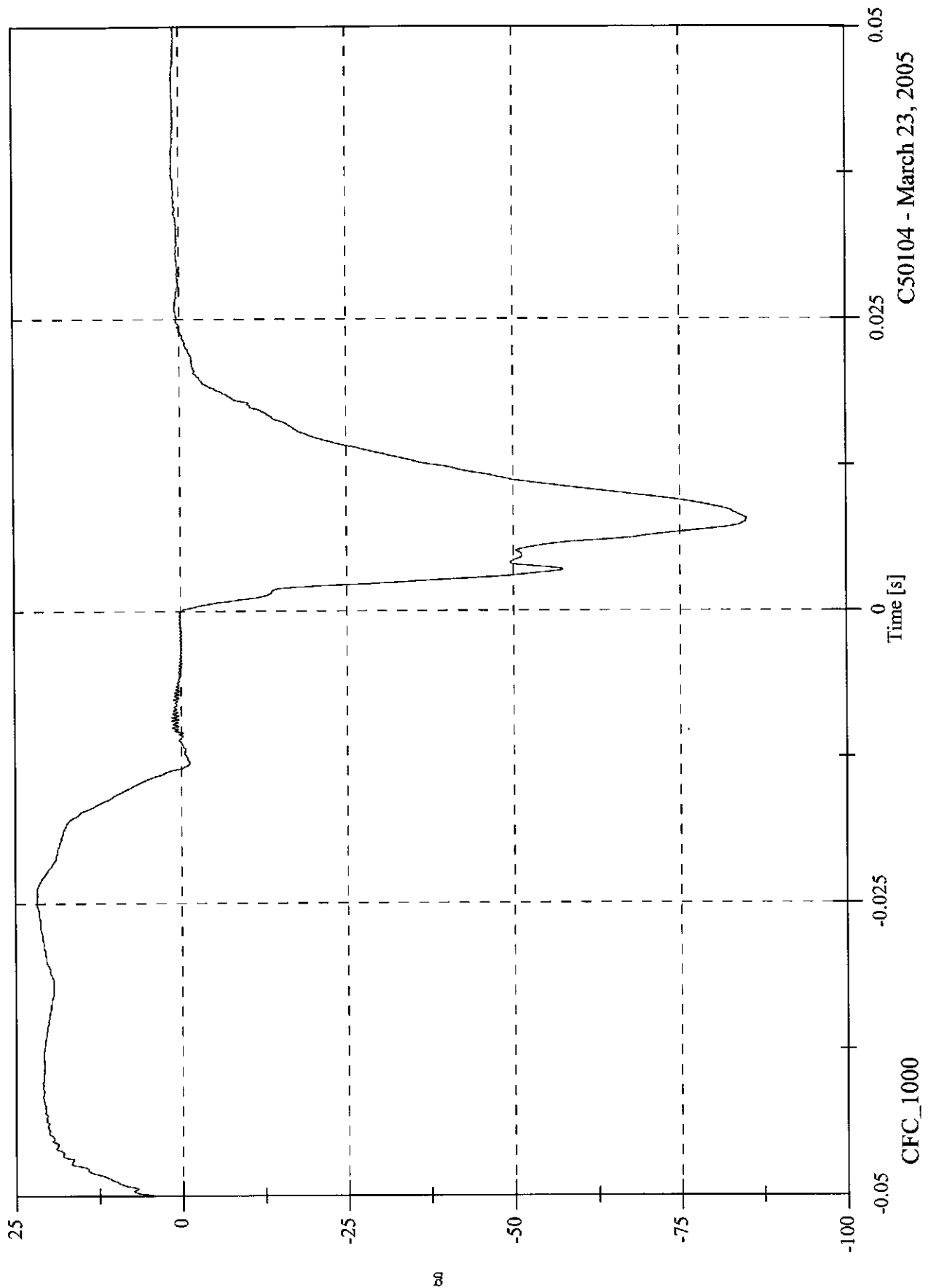
Min: 0.0 [g] at -0.055 [s]



FMVSS 201U IMPACT TEST - 2005 Buick Lacrosse
Headform X Acceleration

Max: 21.8 [g] at -0.025 [s]

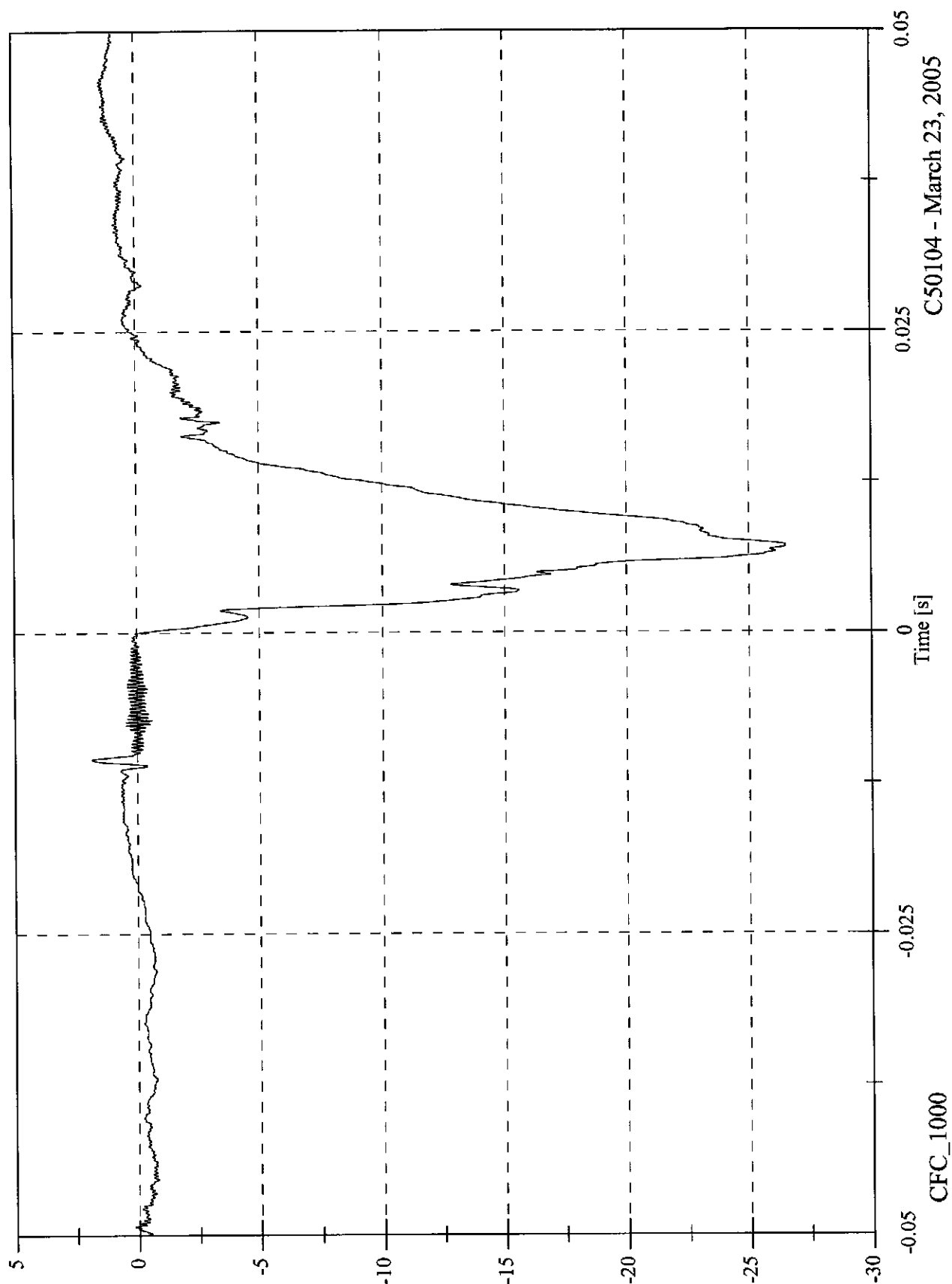
Min: -85.1 [g] at 0.008 [s]



Max: 1.9 [g] at -0.010 [s]
Min: -26.5 [g] at 0.007 [s]

Headform Y Acceleration

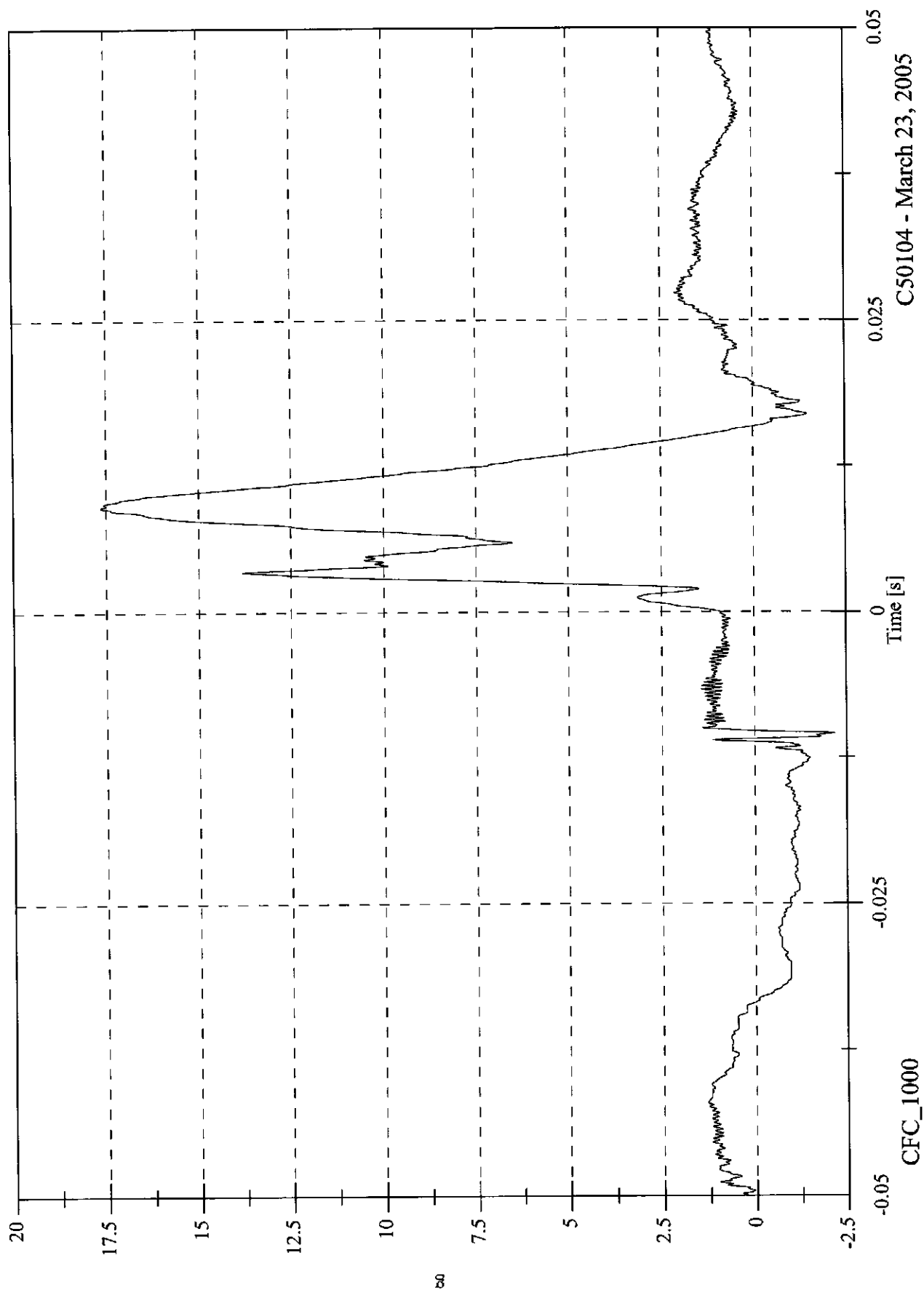
FMVSS 201U IMPACT TEST - 2005 Buick Lacrosse



C50104 - March 23, 2005

FMVSS 201U IMPACT TEST - 2005 Buick Lacrosse
Headform Z Acceleration

Max: 17.7 [g] at 0.009 [s]
Min: -2.2 [g] at -0.010 [s]



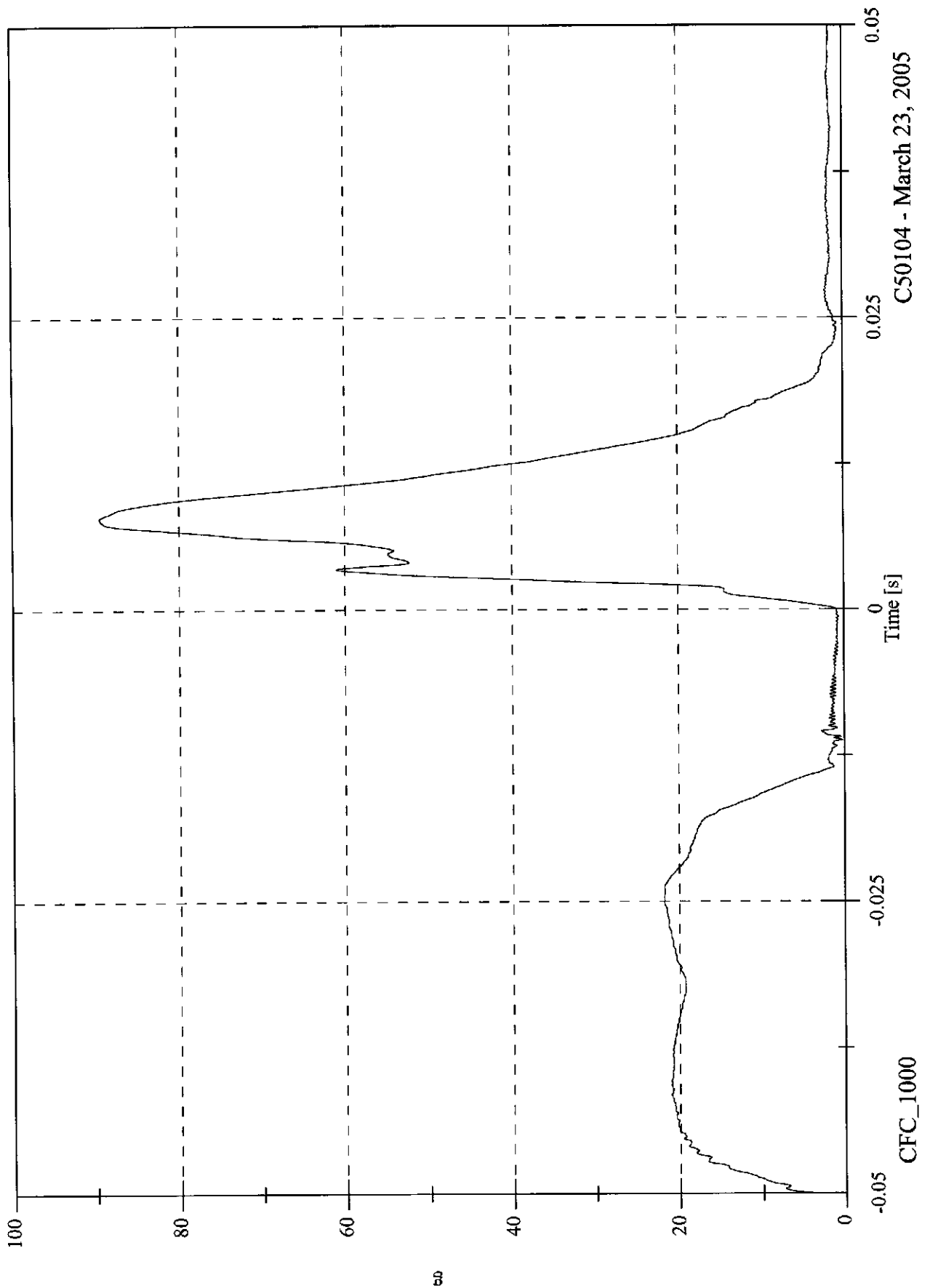
C50104 - March 23, 2005

FMVSS 201U IMPACT TEST - 2005 Buick Lacrosse

Headform Resultant

Max: 89.6 [g] at 0.008 [s]

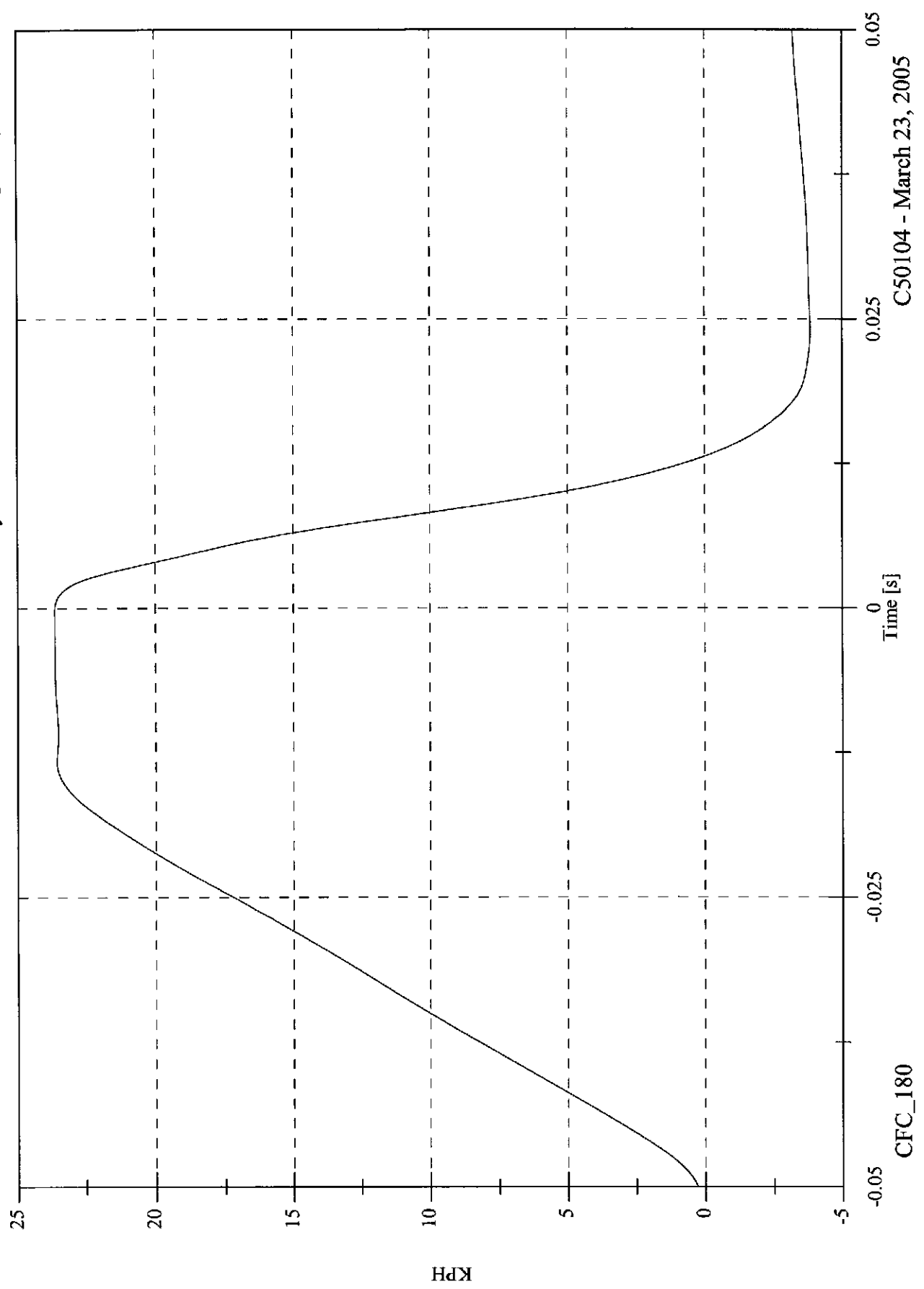
Min: 0.2 [g] at -0.011 [s]



C50104 - March 23, 2005

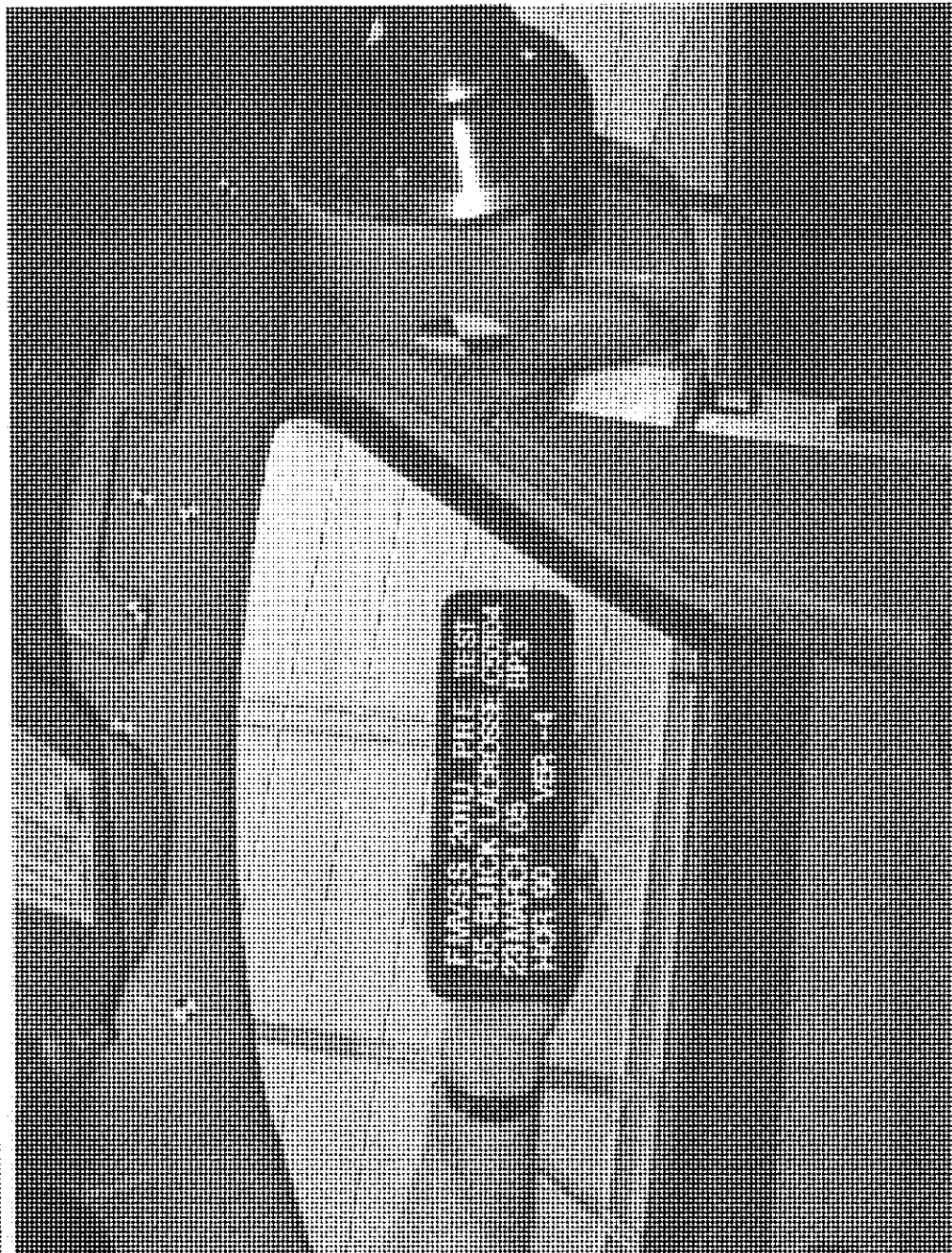
FMVSS 201U IMPACT TEST - 2005 Buick Lacrosse
Max: 23.6 [KPH] at -0.000 [s]
Min: -3.8 [KPH] at 0.024 [s]

Headform Velocity



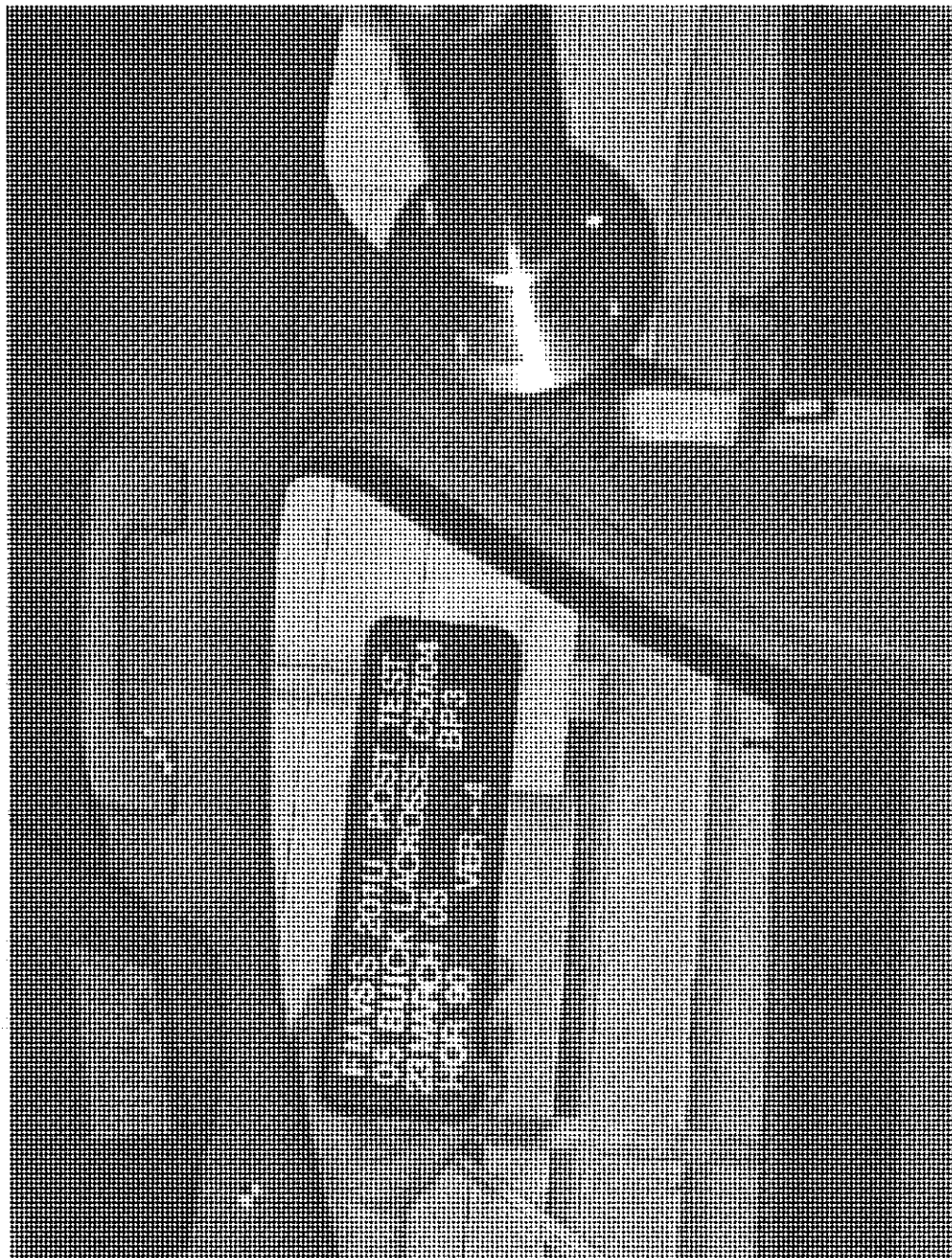
CFC_180

C50104 - March 23, 2005



PRE-IMPACT HP3

8754-FMH-04



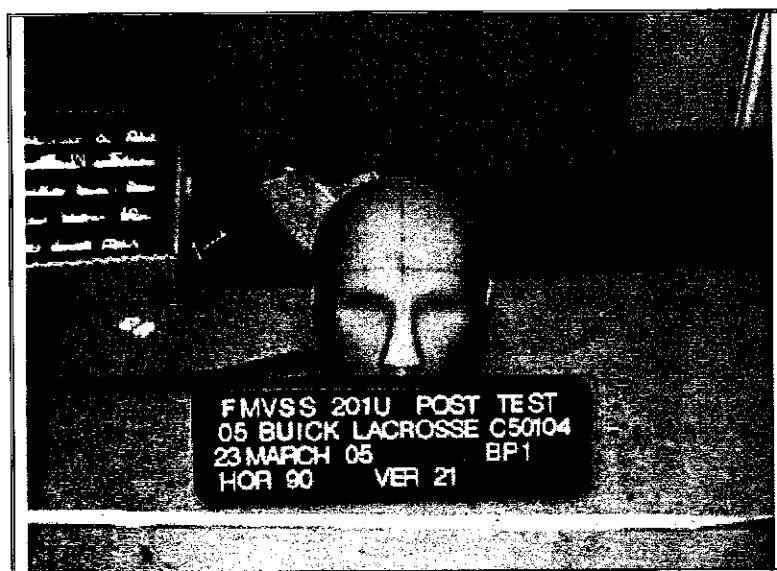
POST-IMPACT BPS

8754-FAMES-04

VEHICLE YEAR/MAKE/MODEL/STYLE:	2005 Buick LaCrosse 4-Door Sedan
VIN:	2G4WC532451200267
DATE OF MANUFACTURE:	10/04(SEE CERTIFICATION LABEL)
COLOR:	Red

Test Number:	05
Test Date:	03/23/05
Target Location:	B-Pillar
Target Code:	BP1
Horizontal Impact Angle:	90°
Vertical Impact Angle:	21°
Ambient Temperature:	24.3C°
Relative Humidity:	13.4
Time of Impact:	11:25
Headform Number:	642

Impact Point Description (from lower midpoint on midsagittal line)			
On Centerline	5	<input checked="" type="checkbox"/> mm right	<input type="checkbox"/> mm left
On Centerline	8	mm up	



POST-IMPACT BP1 HEADFORM

Free Motion HIC	711.2
HIC(d)	703
Impact Velocity (kph)	23.72
HIC T1 (msec)	2.4
HIC T2 (msec)	9.3

FMVSS 201U IMPACT TEST - 2005 Buick Lacrosse C50104 - BP1

FMH Headform 0642

Location: BP1

Test Date: March 23, 2005

Work File: BP1

-----TEST RESULTS-----

Lab Temperature: 24.3 C

HICd: 703.0

Lab Humidity: 13.4 %

HIC (36ms): 711.2

Velocity at Impact: 23.72 KPH

t1: 2.4 msec

t2: 9.3 msec

Free Flight Distance: 212.34 mm

Duration: 6.8 msec

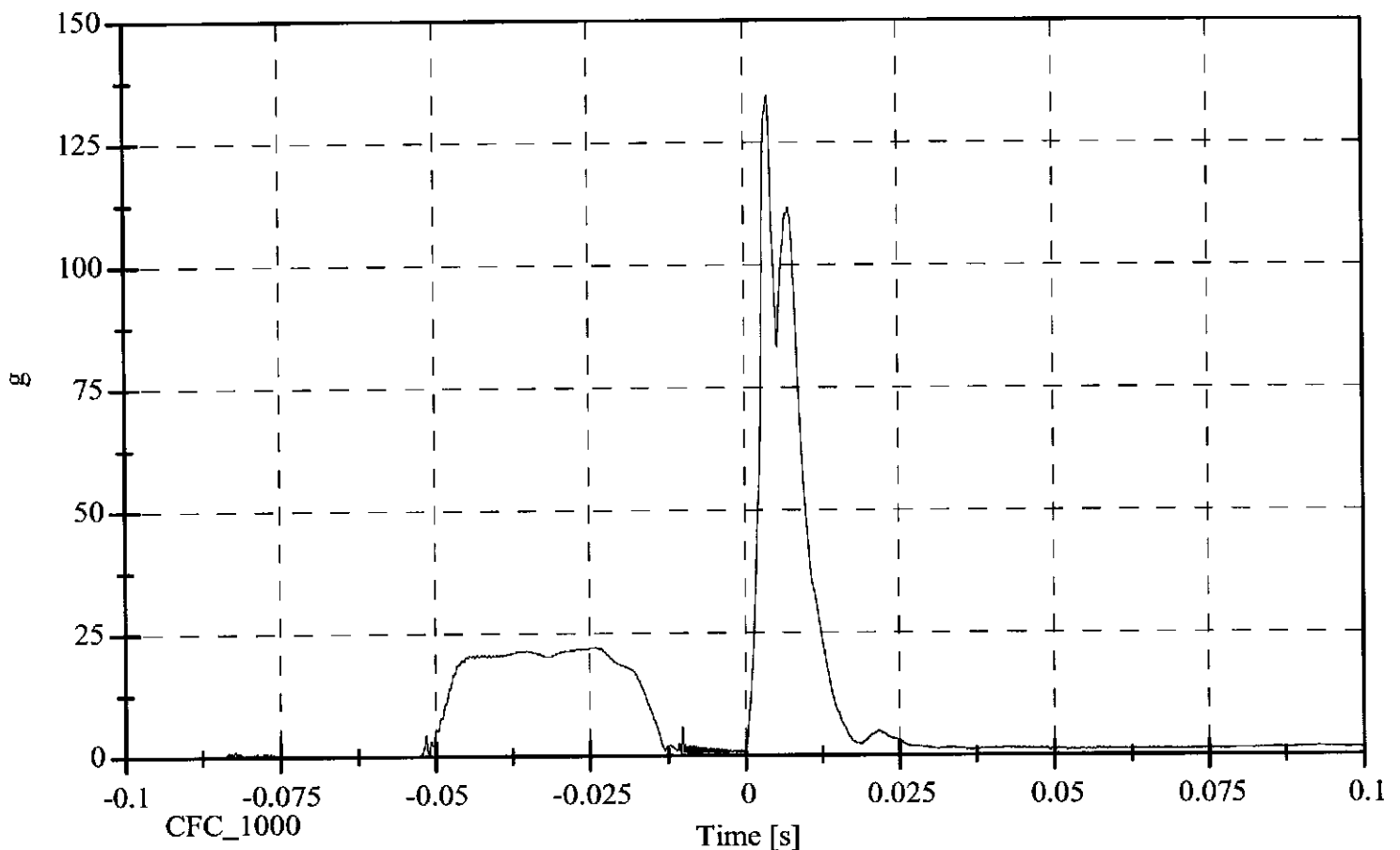
Maximum: 134.5 g

Average Acceleration: 8.9 g

FMVSS 201U IMPACT TEST - 2005 Buick Lacrosse
Headform Resultant

Max: 134.5 [g] at 0.004 [s]

Min: 0.0 [g] at -0.098 [s]

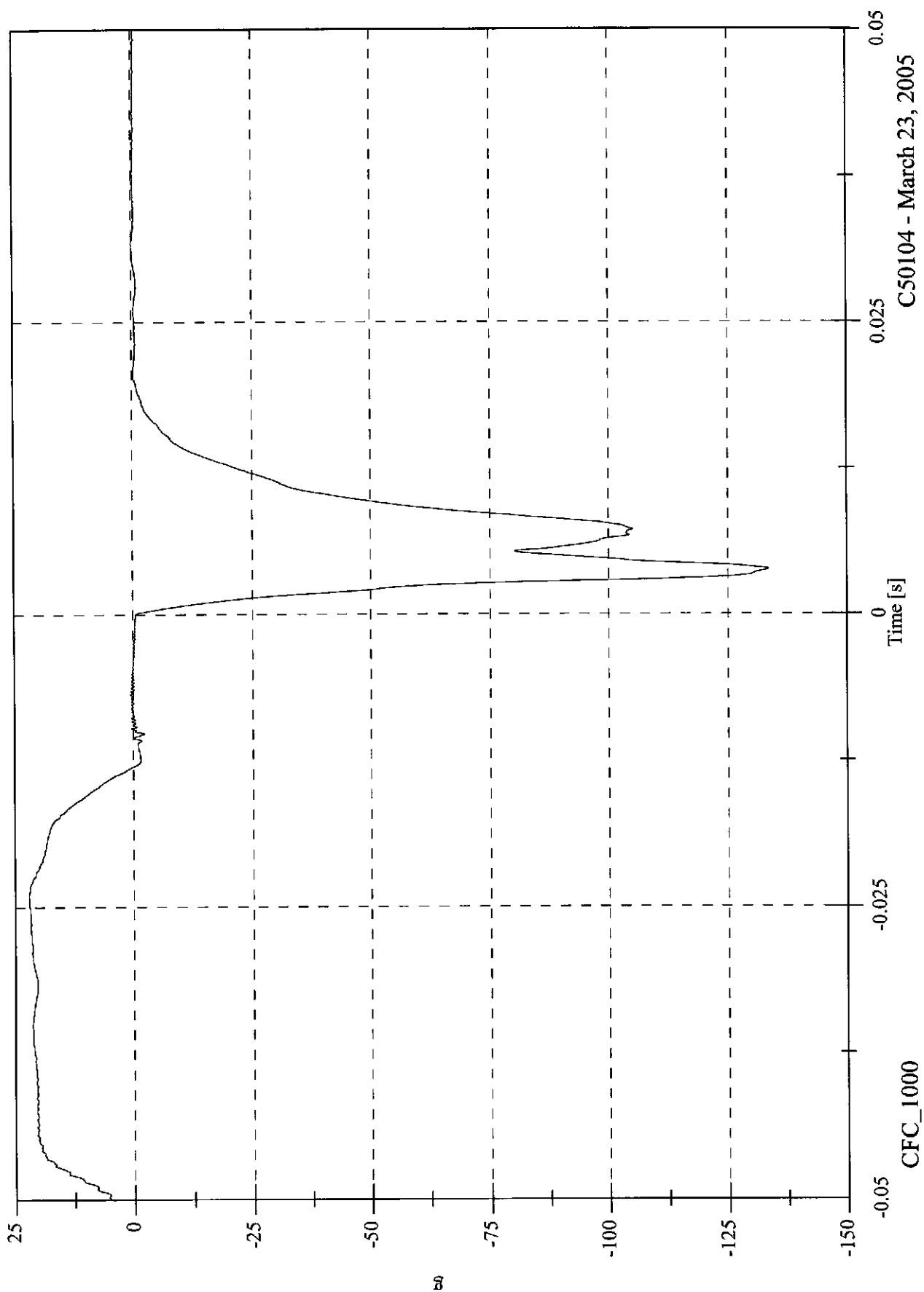


FMVSS 201U IMPACT TEST - 2005 Buick Lacrosse

Headform X Acceleration

Max: 22.0 [g] at -0.024 [s]

Min: -133.5 [g] at 0.004 [s]



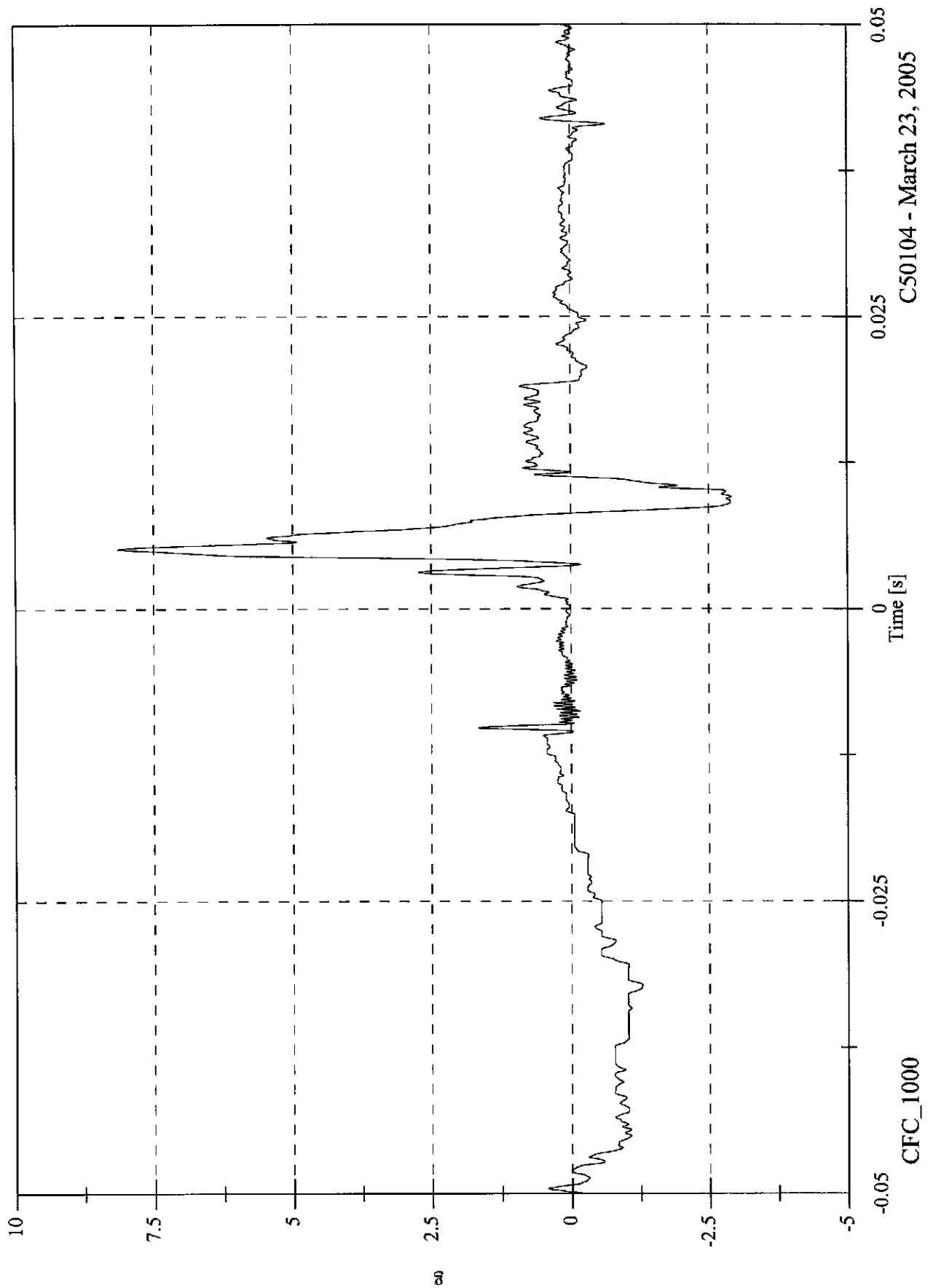
C50104 - March 23, 2005

FMVSS 201U IMPACT TEST - 2005 Buick Lacrosse

Headform Y Acceleration

Max: 8.1 [g] at 0.005 [s]

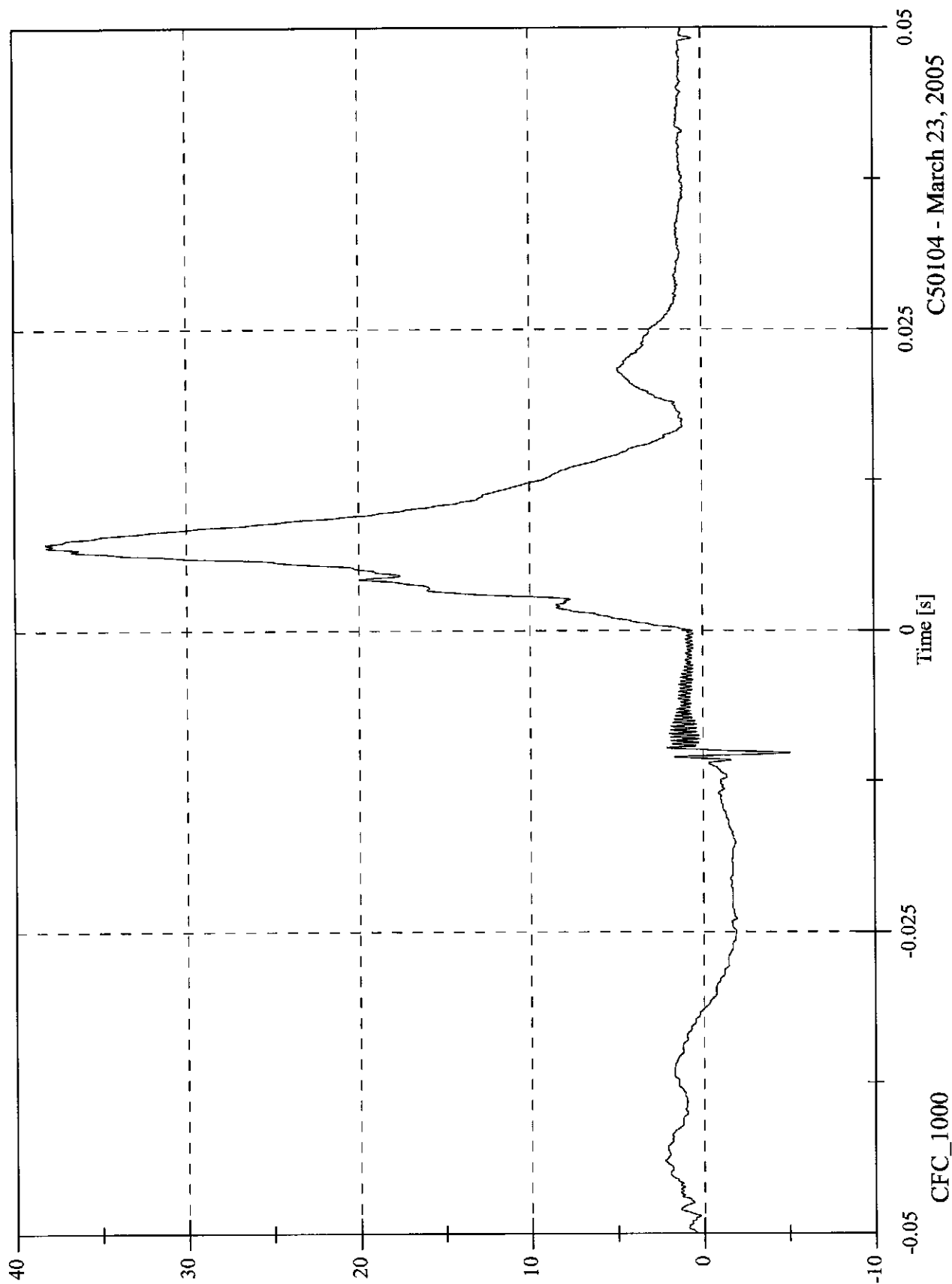
Min: -2.9 [g] at 0.010 [s]



FMVSS 201U IMPACT TEST - 2005 Buick Lacrosse

Headform Z Acceleration

Max: 38.2 [g] at 0.007 [s]
Min: -5.1 [g] at -0.010 [s]

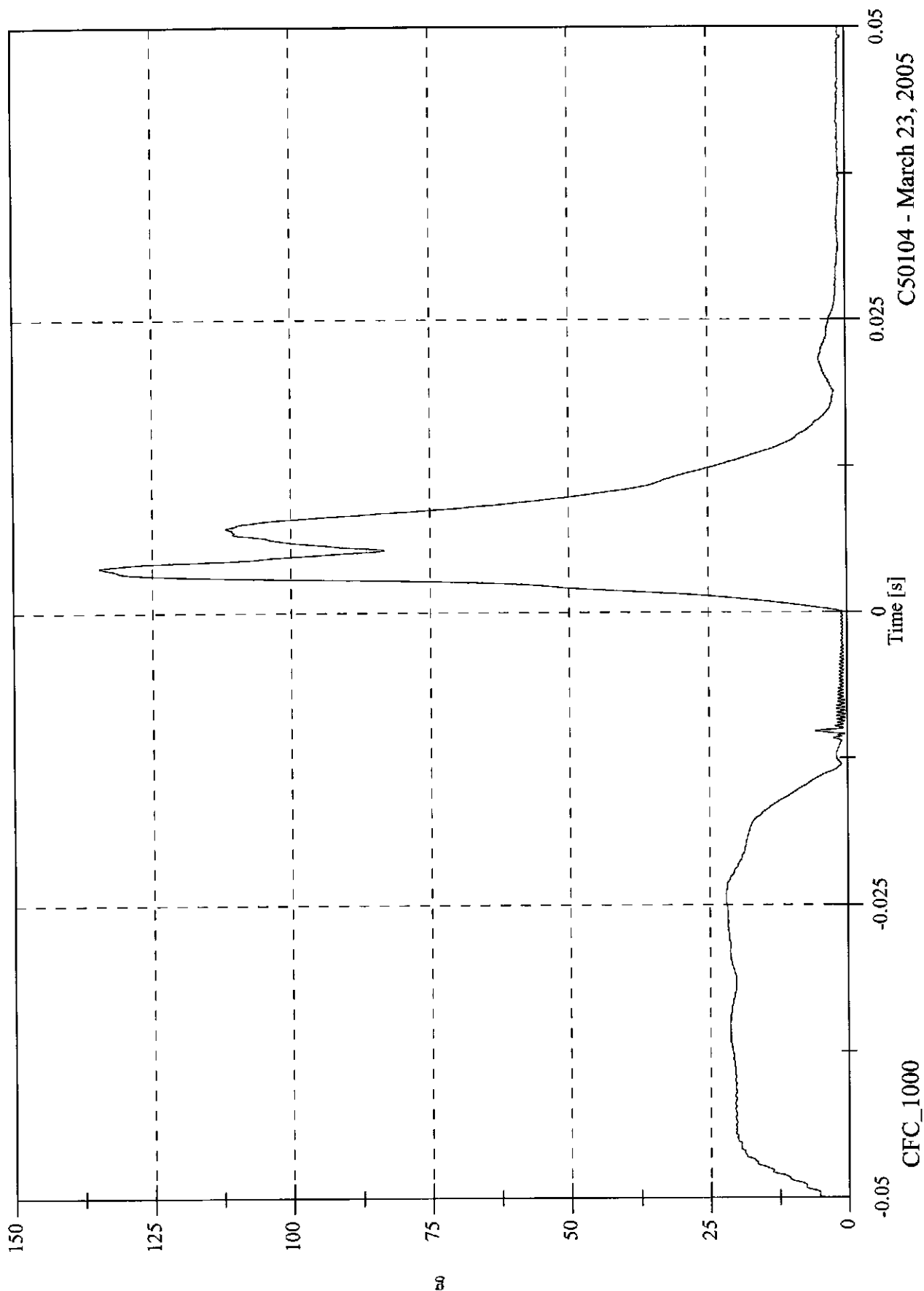


C50104 - March 23, 2005

Max: 134.5 [g] at 0.004 [s]
Min: 0.3 [g] at -0.008 [s]

Headform Resultant

FMVSS 201U IMPACT TEST - 2005 Buick Lacrosse

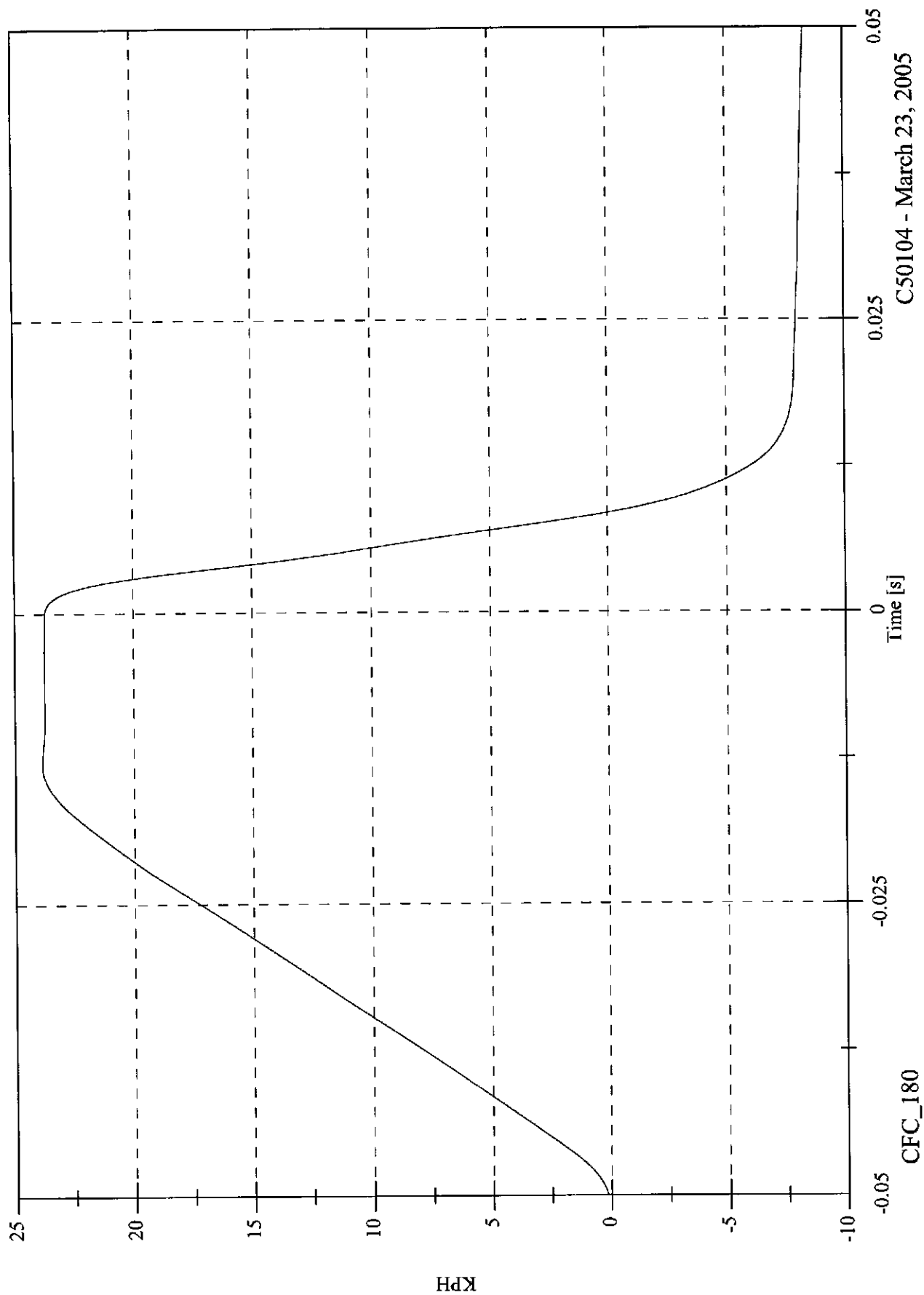


C50104 - March 23, 2005

Max: 23.9 [KPH] at -0.013 [s]
Min: -8.3 [KPH] at 0.050 [s]

FMVSS 201U IMPACT TEST - 2005 Buick Lacrosse

Headform Velocity

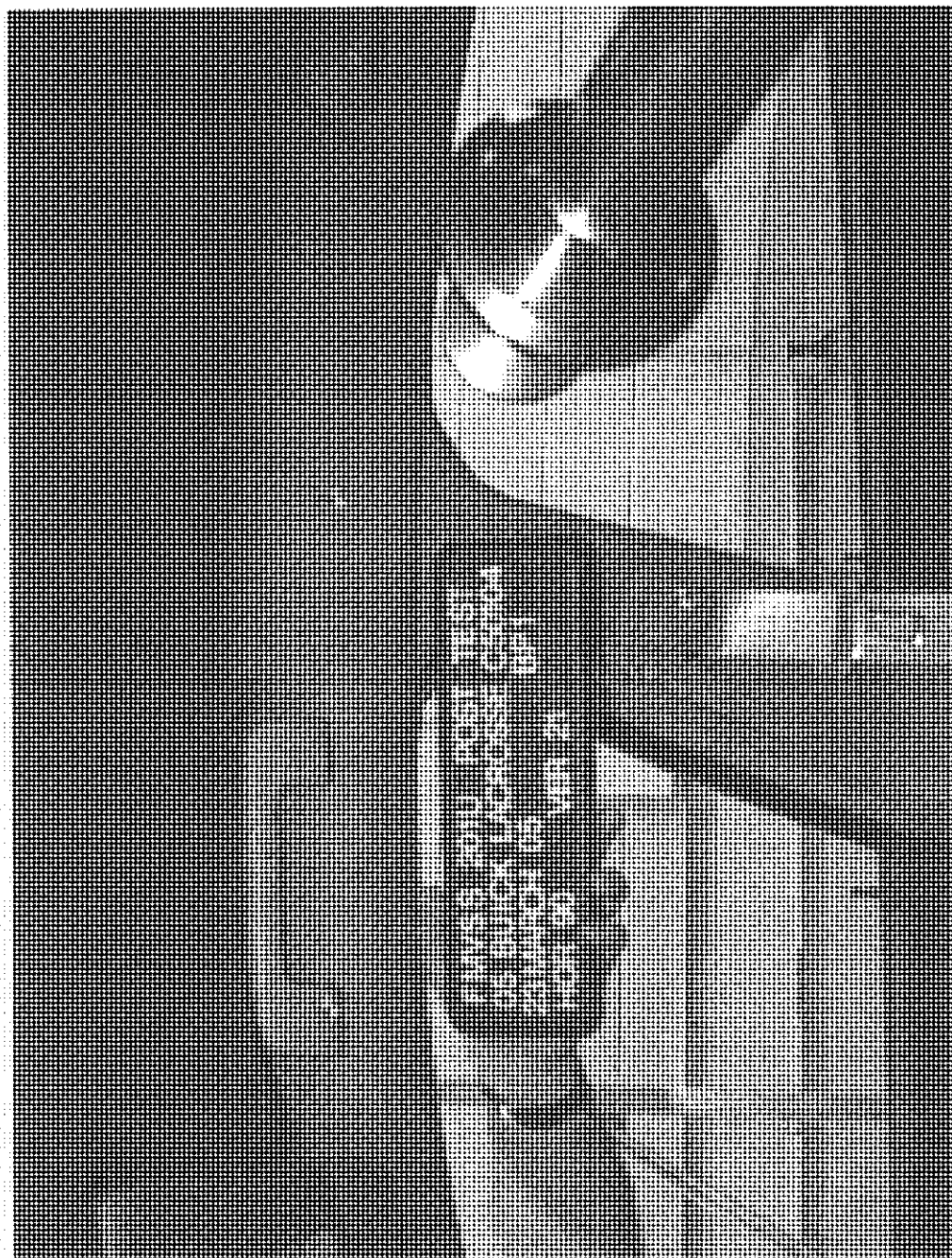


C50104 - March 23, 2005



PRE-IMPACT HPI

8754-FMI-04



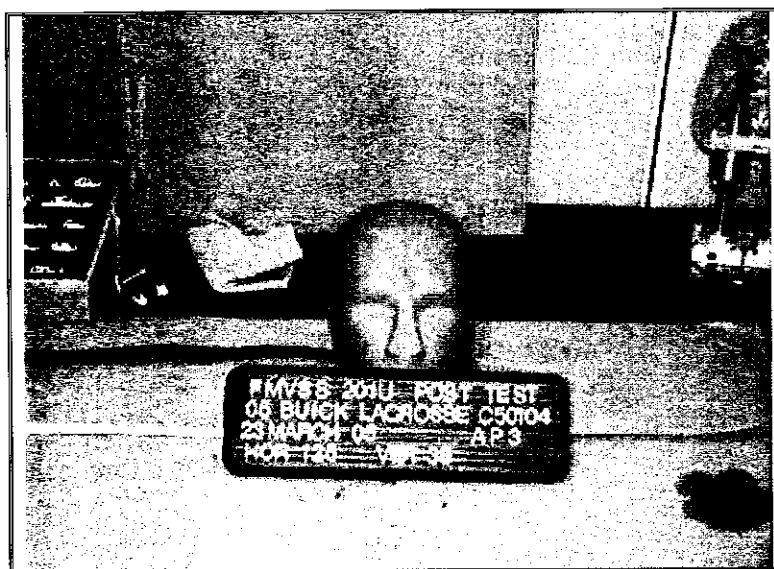
POST-IMPACT BPE

8754.FMH-04

VEHICLE YEAR/MAKE/MODEL/STYLE:	2005 Buick LaCrosse 4-Door Sedan
VIN:	2G4WC532451200267
DATE OF MANUFACTURE:	10/04(SEE CERTIFICATION LABEL)
COLOR:	Red

Test Number:	06
Test Date:	03/23/05
Target Location:	A-Pillar
Target Code:	AP3
Horizontal Impact Angle:	125°
Vertical Impact Angle:	38°
Ambient Temperature:	24.5C°
Relative Humidity:	13.7
Time of Impact:	13:20
Headform Number:	62

Impact Point Description (from lower midpoint on midsagittal line)				
On Centerline	6	<input checked="" type="checkbox"/>	mm right	<input type="checkbox"/> mm left
On Centerline	20		mm up	



POST-IMPACT AP3 HEADFORM

Free Motion HIC	668.1
HIC(d)	664.9
Impact Velocity (kph)	23.89
HIC T1 (msec)	1.7
HIC T2 (msec)	7.2

FMVSS 201U IMPACT TEST - 2005 Buick Lacrosse Sedan C50104 - AP3

FMH Headform 0062

Location: AP3

Test Date: March 23, 2005

Work File: AP3

-----TEST RESULTS-----

Lab Temperature: 24.5 C

HICd: 668.1

Lab Humidity: 13.7 %

HIC (36ms): 664.9

Velocity at Impact: 23.89 KPH

t1: 1.7 msec

t2: 7.2 msec

Free Flight Distance: 216.85 mm

Duration: 5.5 msec

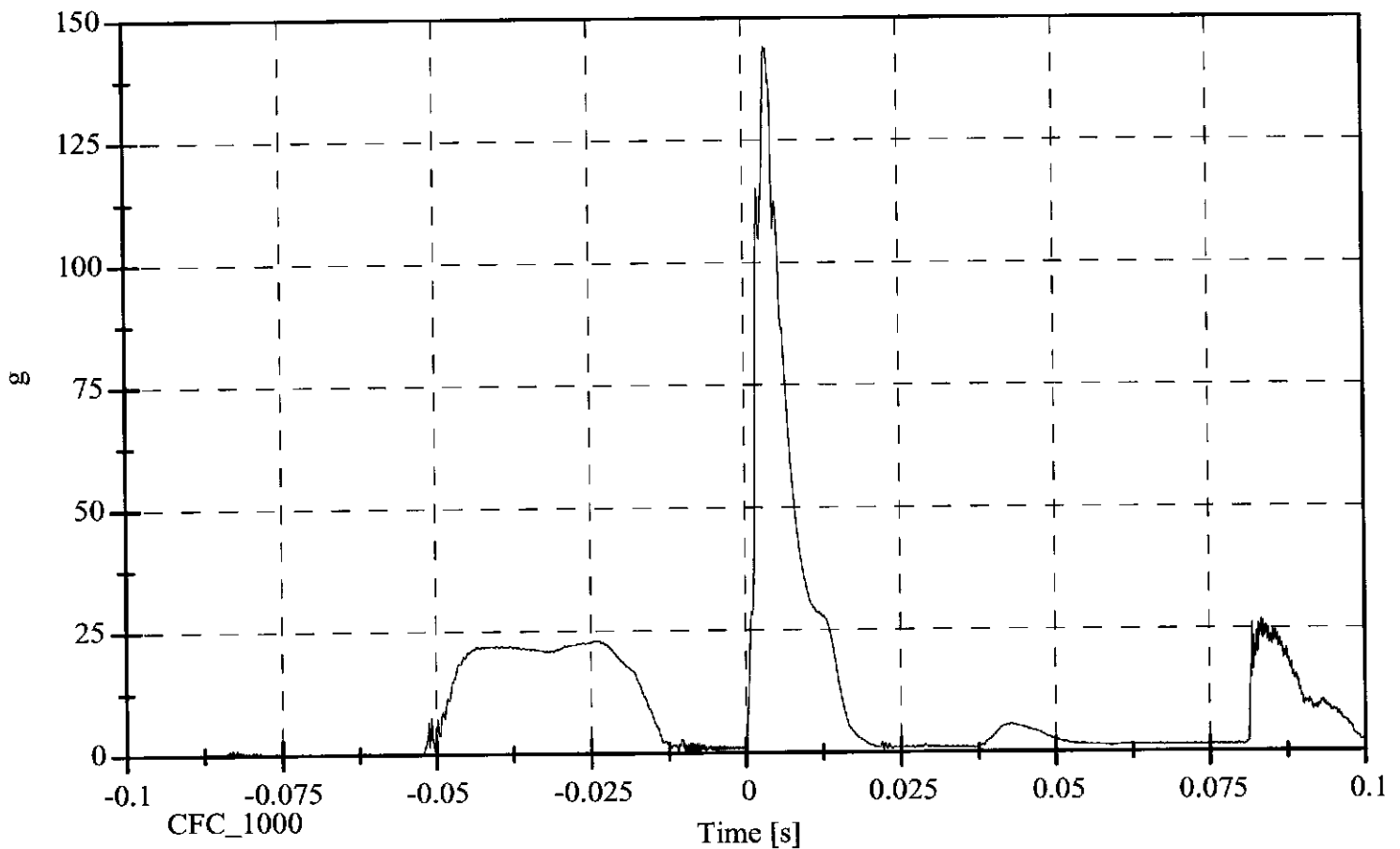
Maximum: 144.2 g

Average Acceleration: 10.0 g

FMVSS 201U IMPACT TEST - 2005 Buick Lacrosse Sedan
Headform Resultant

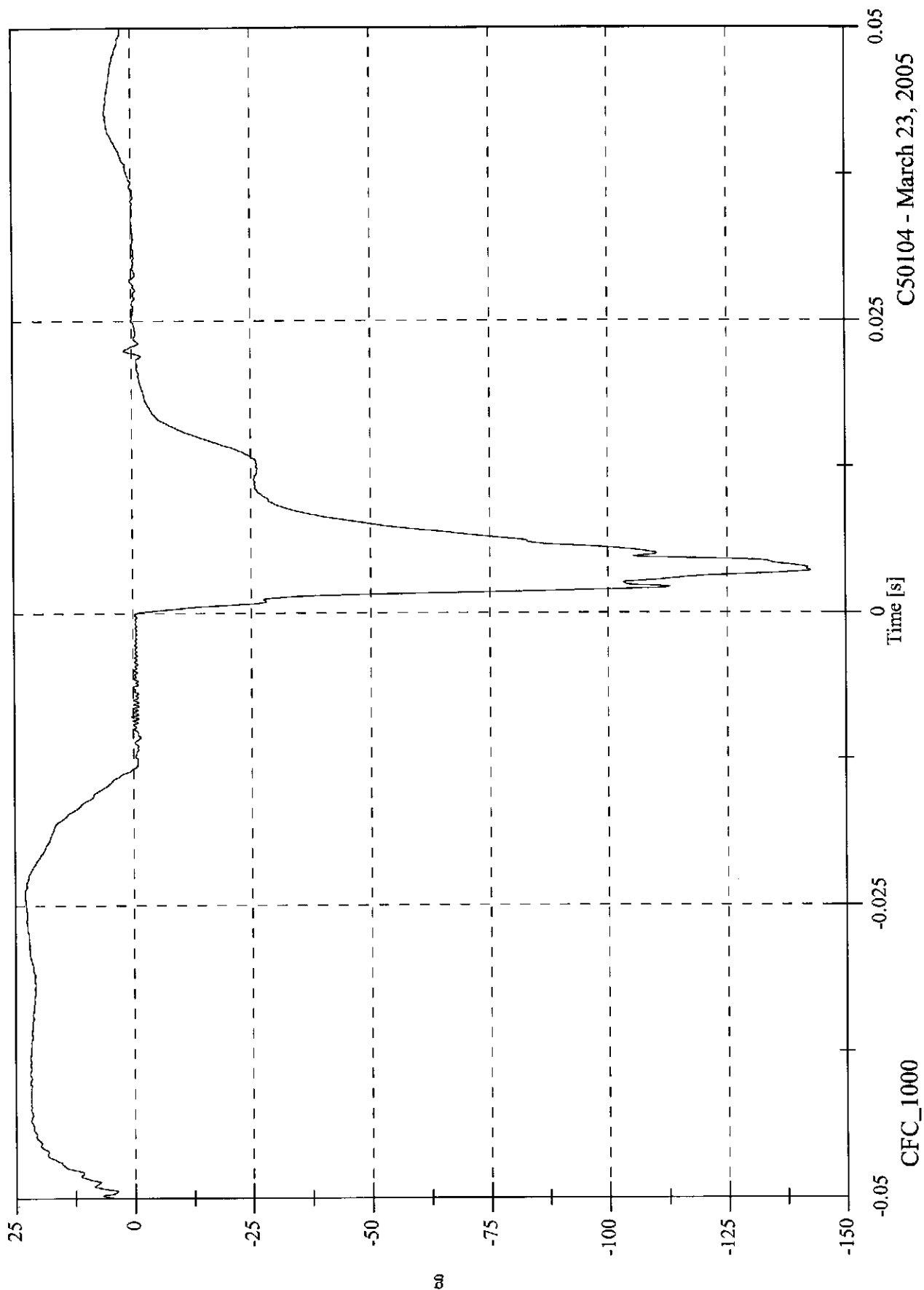
Max: 144.2 [g] at 0.004 [s]

Min: 0.0 [g] at -0.098 [s]



Max: 22.9 [g] at -0.024 [s]
Min: -142.6 [g] at 0.004 [s]

FMVSS 201U IMPACT TEST - 2005 Buick Lacrosse Sedan
Headform X Acceleration



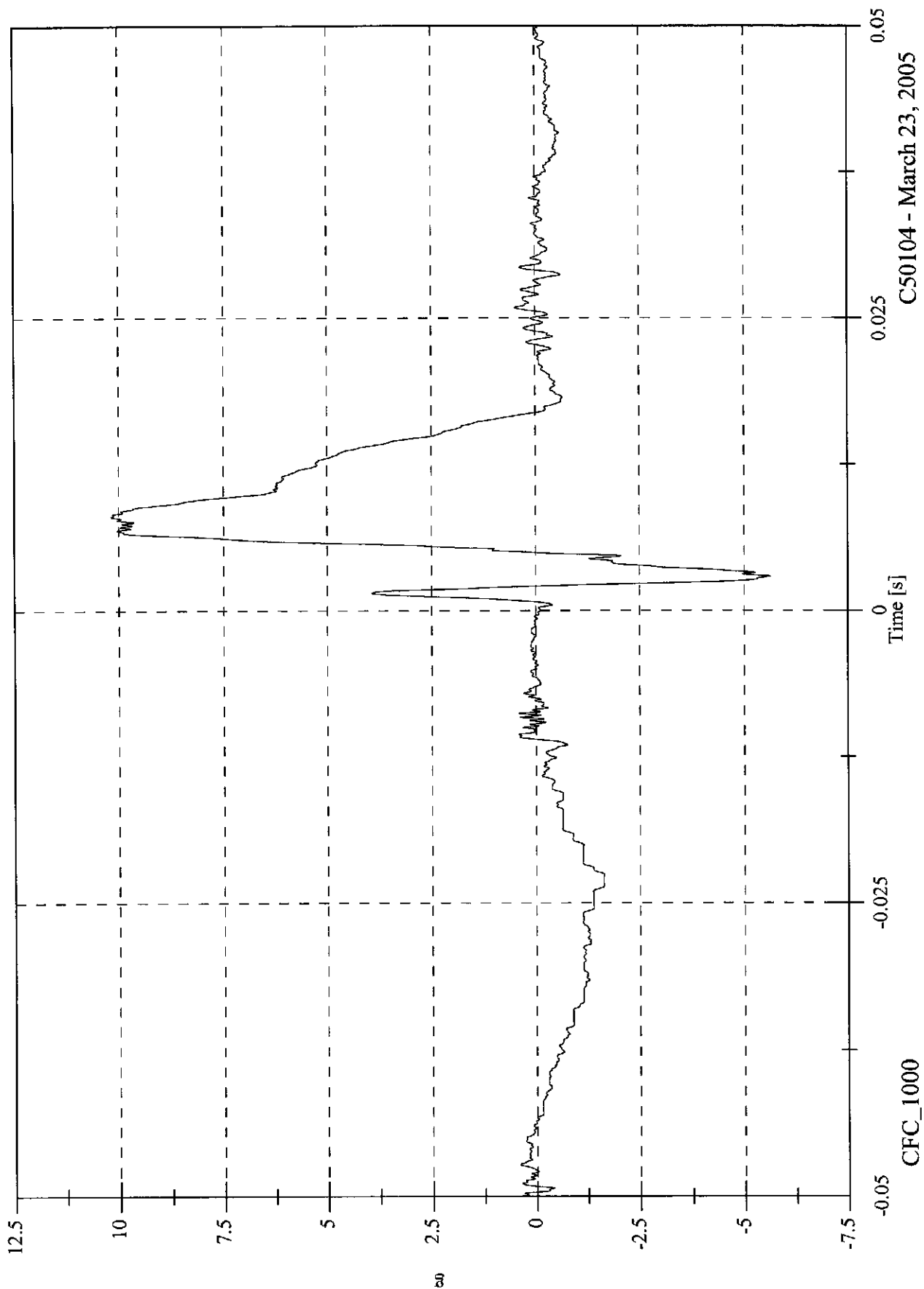
C50104 - March 23, 2005

FMVSS 201U IMPACT TEST - 2005 Buick Lacrosse Sedan

Headform Y Acceleration

Max: 10.2 [g] at 0.008 [s]

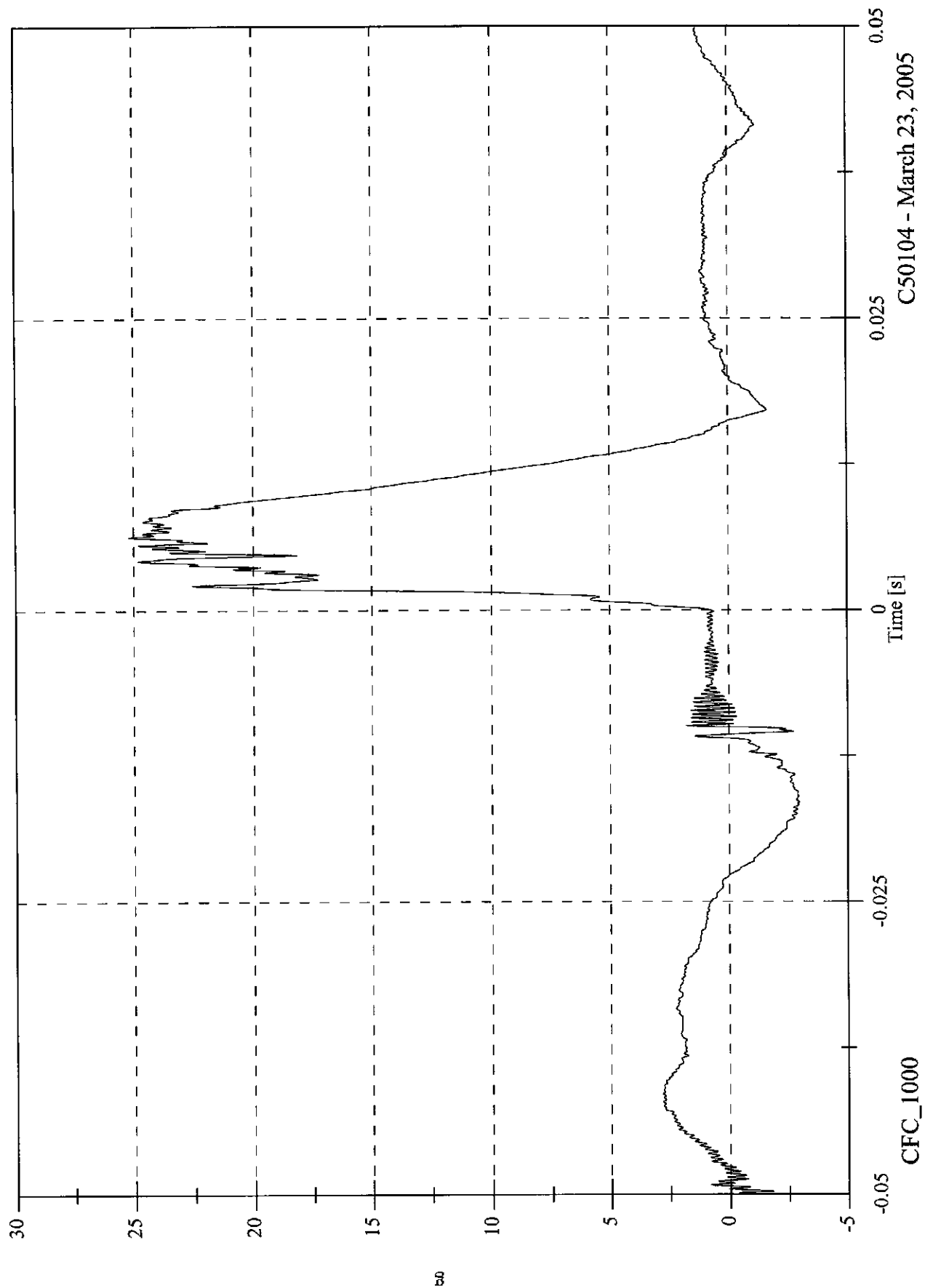
Min: -5.6 [g] at 0.003 [s]



C50104 - March 23, 2005

FMVSS 201U IMPACT TEST - 2005 Buick Lacrosse Sedan
Headform Z Acceleration

Max: 25.2 [g] at 0.006 [s]
Min: -2.9 [g] at -0.016 [s]

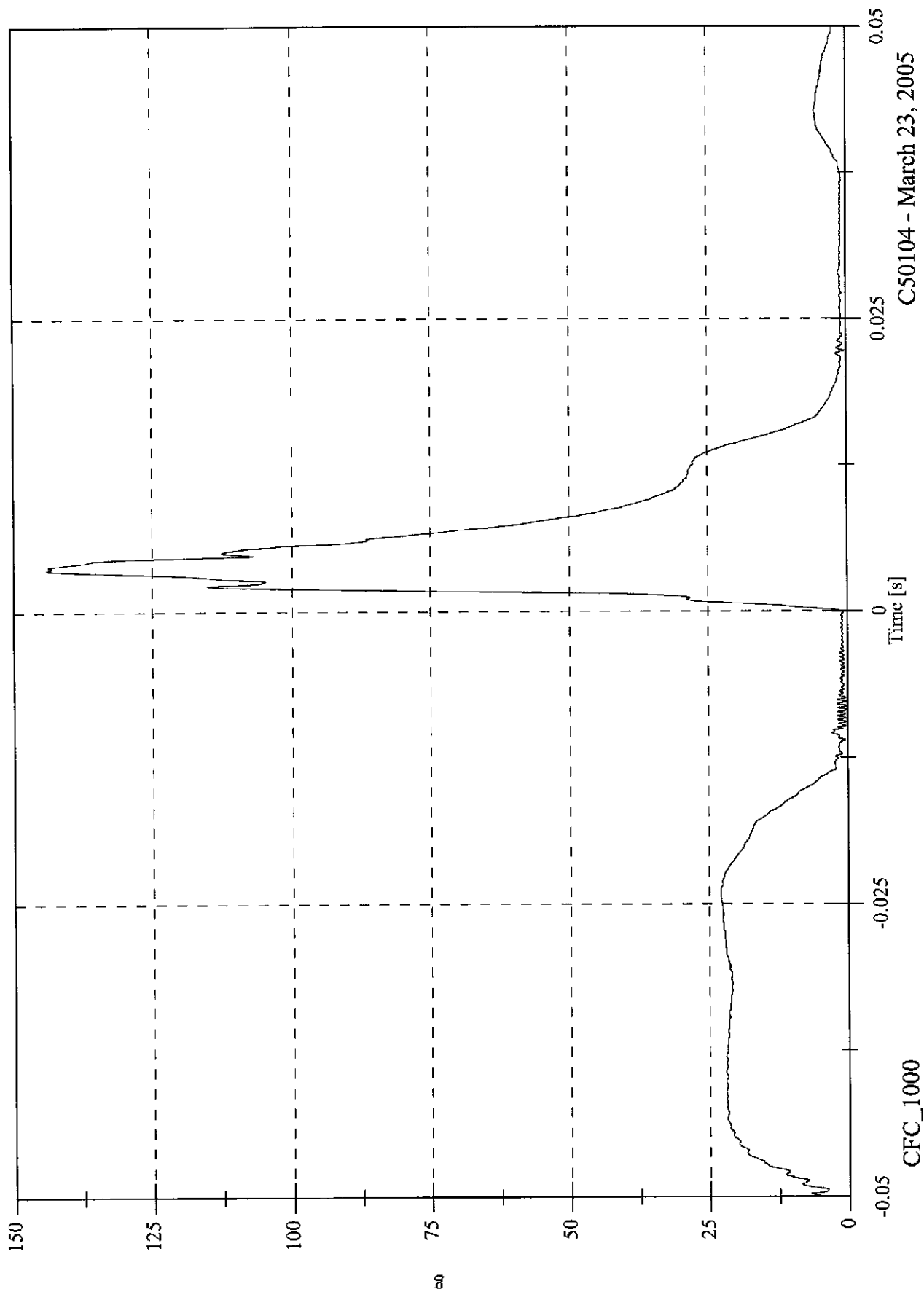


C50104 - March 23, 2005

Max: 144.2 [g] at 0.004 [s]
Min: 0.1 [g] at -0.008 [s]

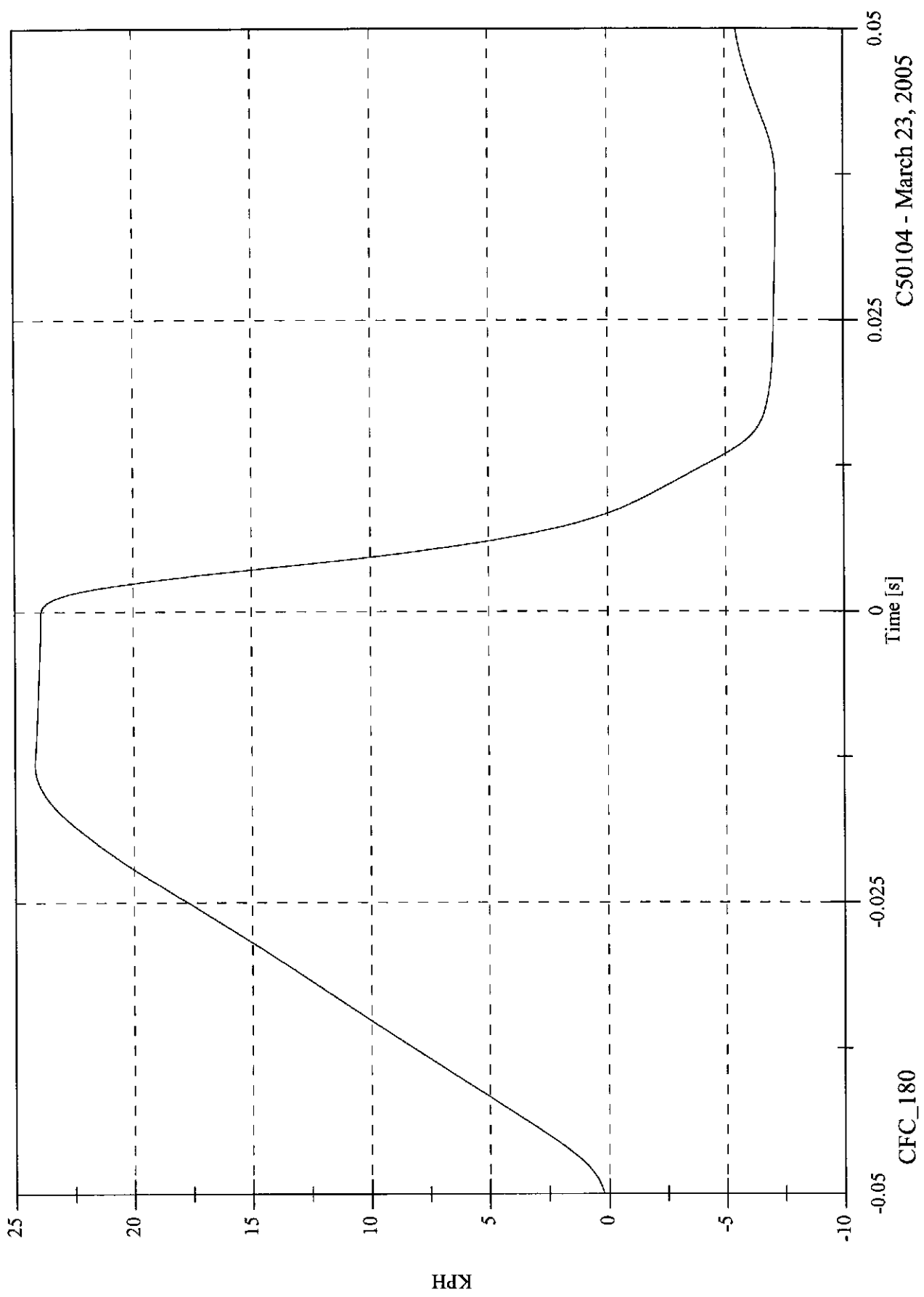
FMVSS 201U IMPACT TEST - 2005 Buick Lacrosse Sedan

Headform Resultant



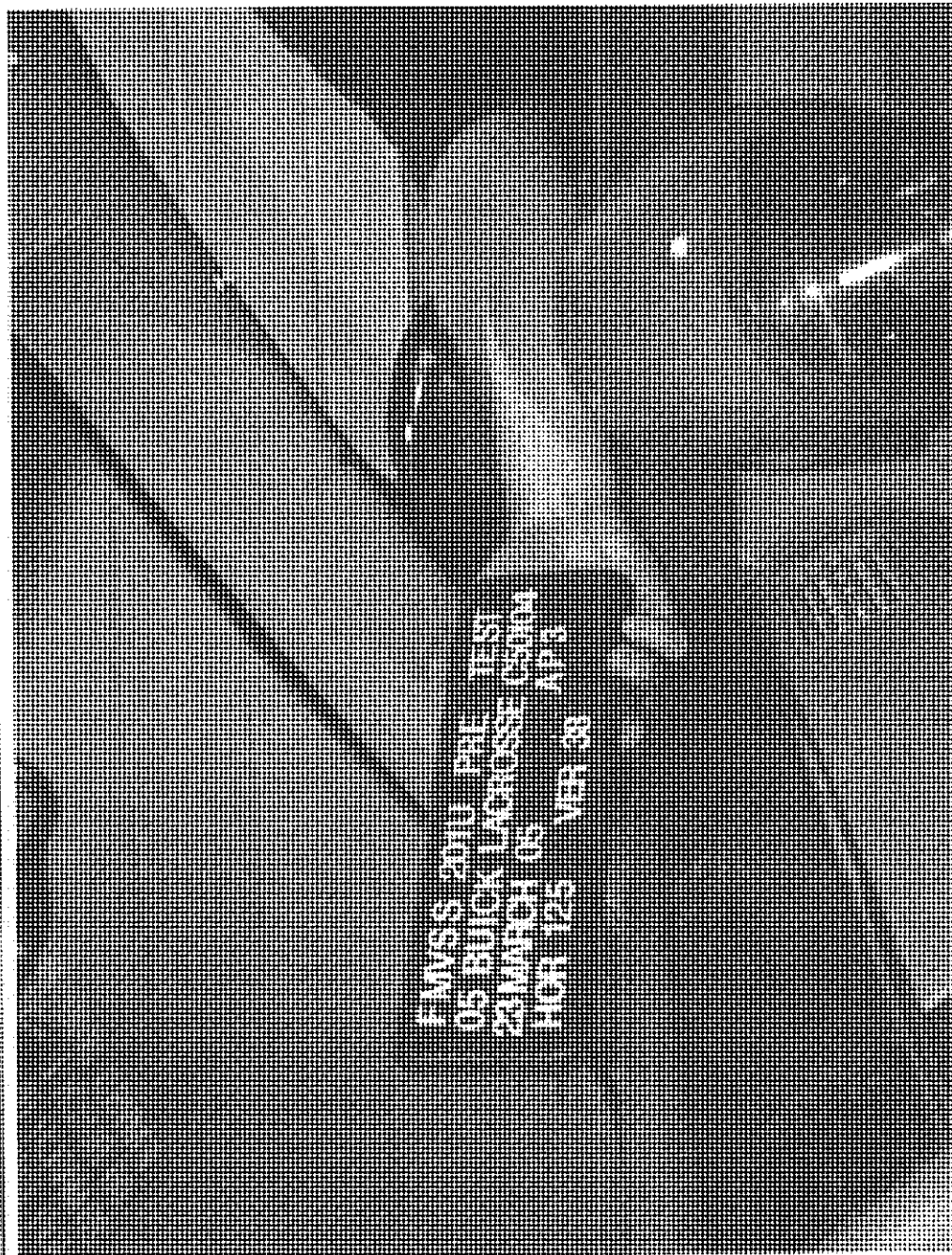
C50104 - March 23, 2005

FMVSS 201U IMPACT TEST - 2005 Buick Lacrosse Sedan
Headform Velocity
Max: 24.2 [KPH] at -0.013 [s]
Min: -7.2 [KPH] at 0.036 [s]



C50104 Passenger Side AP3 Impact Plot #5

C50104 - March 23, 2005



FMVSS 2010 PRE TEST
05 BUICK LACROSSE CS01A
23MARCH 05
FCH 125 VER 38 AP3

PRE-IMPACT AP3

8754-FMH-04

FMVSS 201U POST TEST
05 BUICK LACROSSE C50104
23 MARCH 05
HON 125 VER 38 AP 3

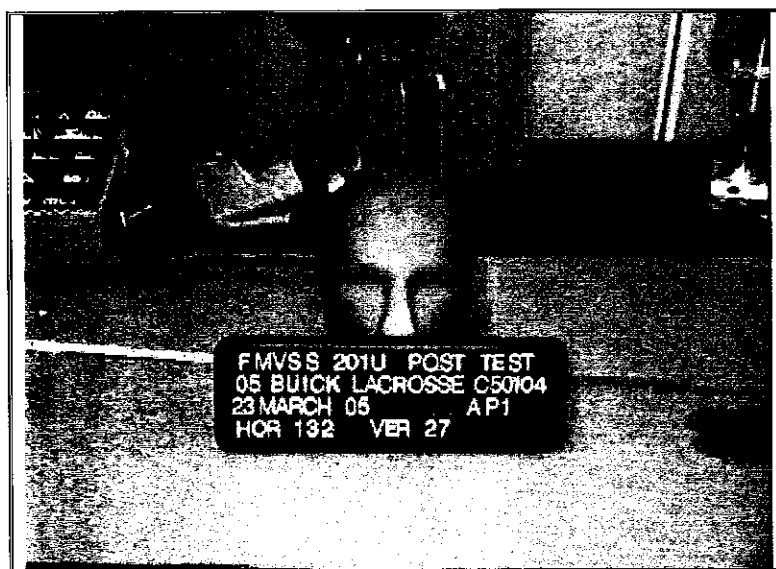
POST-IMPACT AP3

8754-TMII-C4

VEHICLE YEAR/MAKE/MODEL/STYLE:	2005 Buick LaCrosse 4-Door Sedan
VIN:	2G4WC532451200267
DATE OF MANUFACTURE:	10/04(SEE CERTIFICATION LABEL)
COLOR:	Red

Test Number:	07
Test Date:	03/23/05
Target Location:	A-Pillar
Target Code:	AP1
Horizontal Impact Angle:	132°
Vertical Impact Angle:	27°
Ambient Temperature:	24.6C°
Relative Humidity:	14.6
Time of Impact:	13:55
Headform Number:	355

Impact Point Description (from lower midpoint on midsagittal line)			
On Centerline	35	<input checked="" type="checkbox"/> mm right	<input type="checkbox"/> mm left
On Centerline	28	mm up	



POST-IMPACT AP1 HEADFORM

Free Motion HIC	641.7
HIC(d)	650.5
Impact Velocity (kph)	23.46
HIC T1 (msec)	2.3
HIC T2 (msec)	7.7

FMVSS 201U IMPACT TEST - 2005 Buick Lacrosse C50104 - AP1

FMH Headform 0355

Location: AP1

Test Date: March 23, 2005

Work File: AP1

-----TEST RESULTS-----

Lab Temperature: 24.6 C

HICd: 650.5

Lab Humidity: 14.6 %

HIC (36ms): 641.7

Velocity at Impact: 23.46 KPH

t1: 2.3 msec

t2: 7.7 msec

Free Flight Distance: 220.93 mm

Duration: 5.4 msec

Maximum: 144.8 g

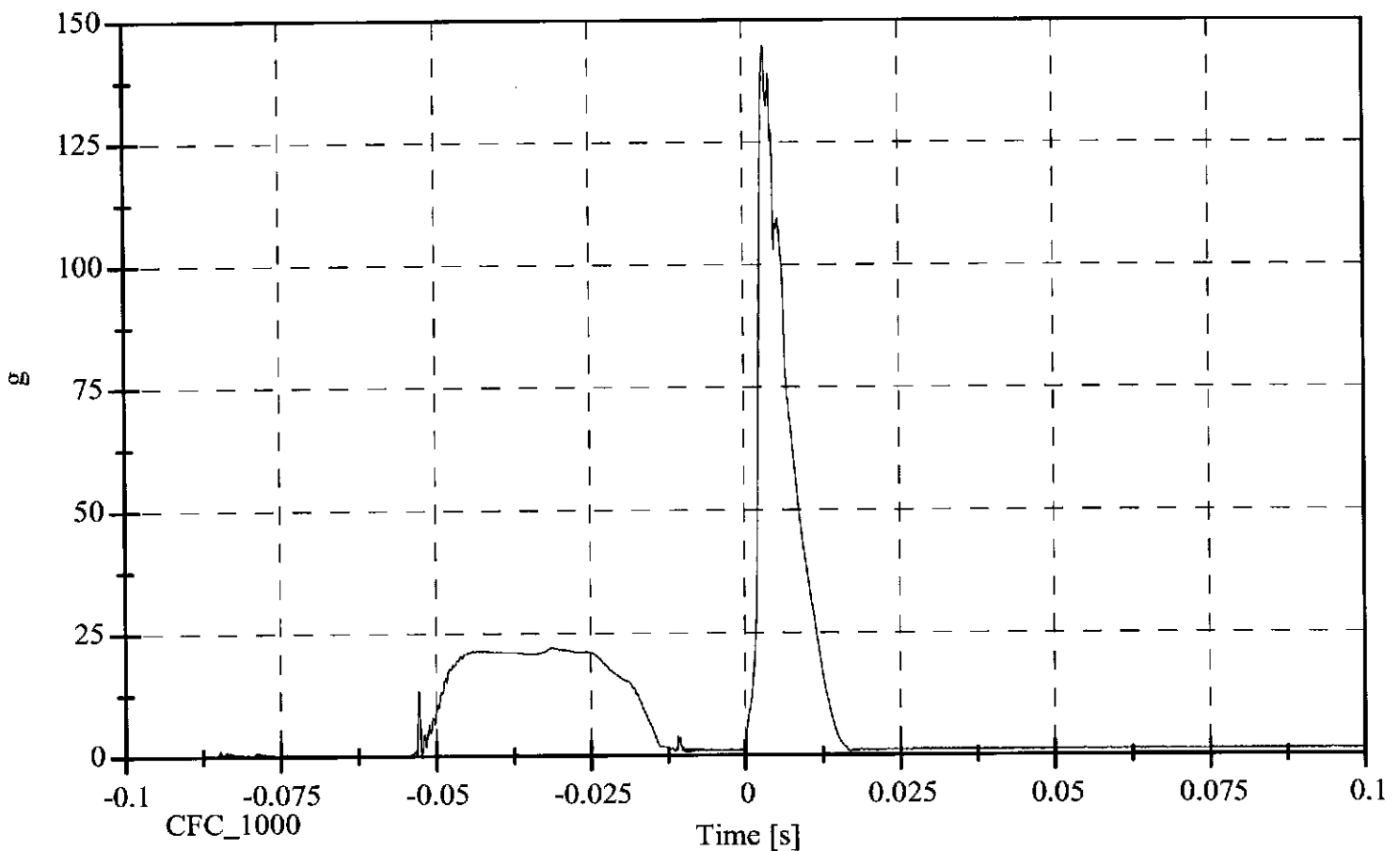
Average Acceleration: 8.2 g

FMVSS 201U IMPACT TEST - 2005 Buick Lacrosse

Max: 144.8 [g] at 0.003 [s]

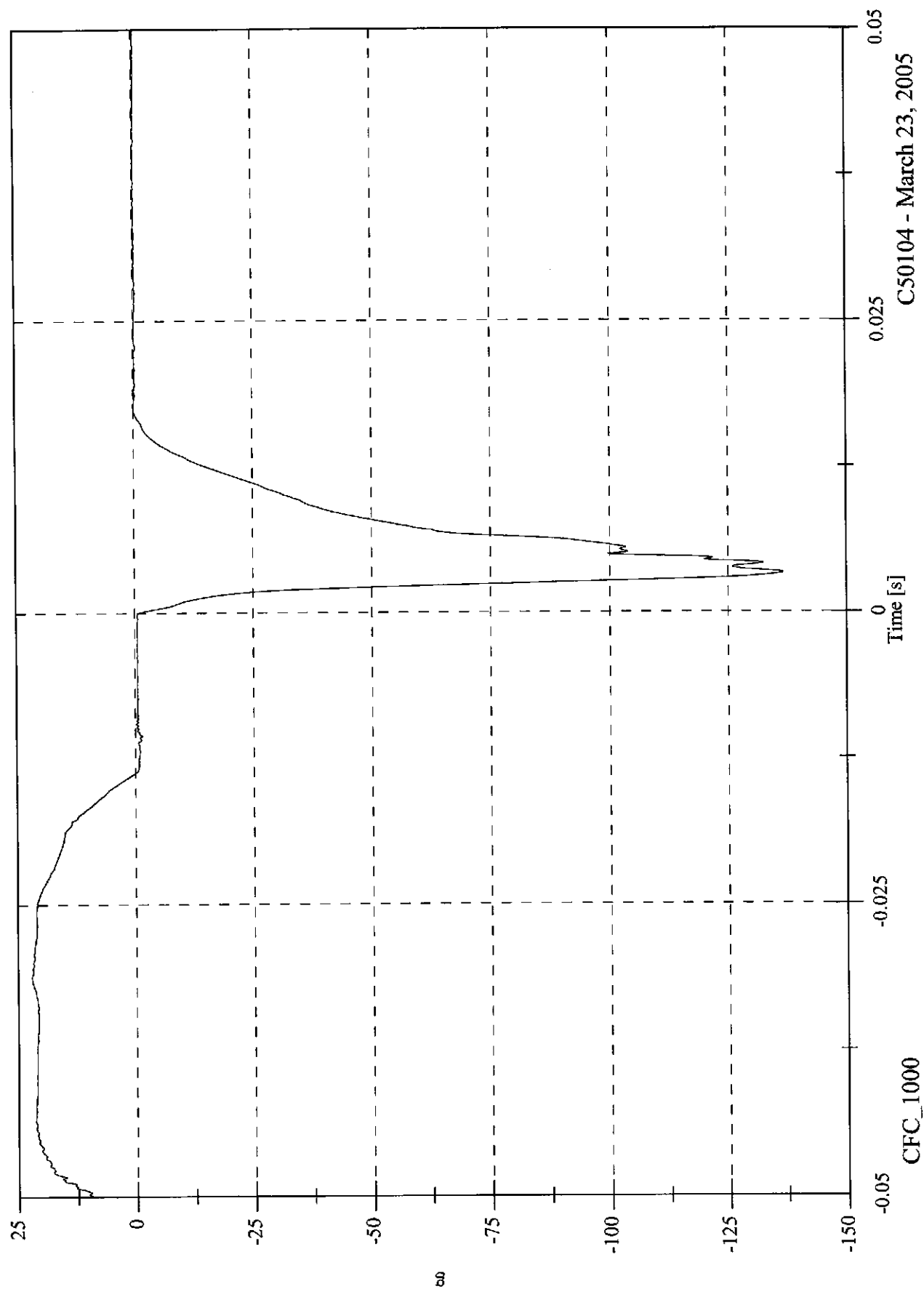
Headform Resultant

Min: 0.0 [g] at -0.067 [s]



FMVSS 201U IMPACT TEST - 2005 Buick Lacrosse
Headform X Acceleration

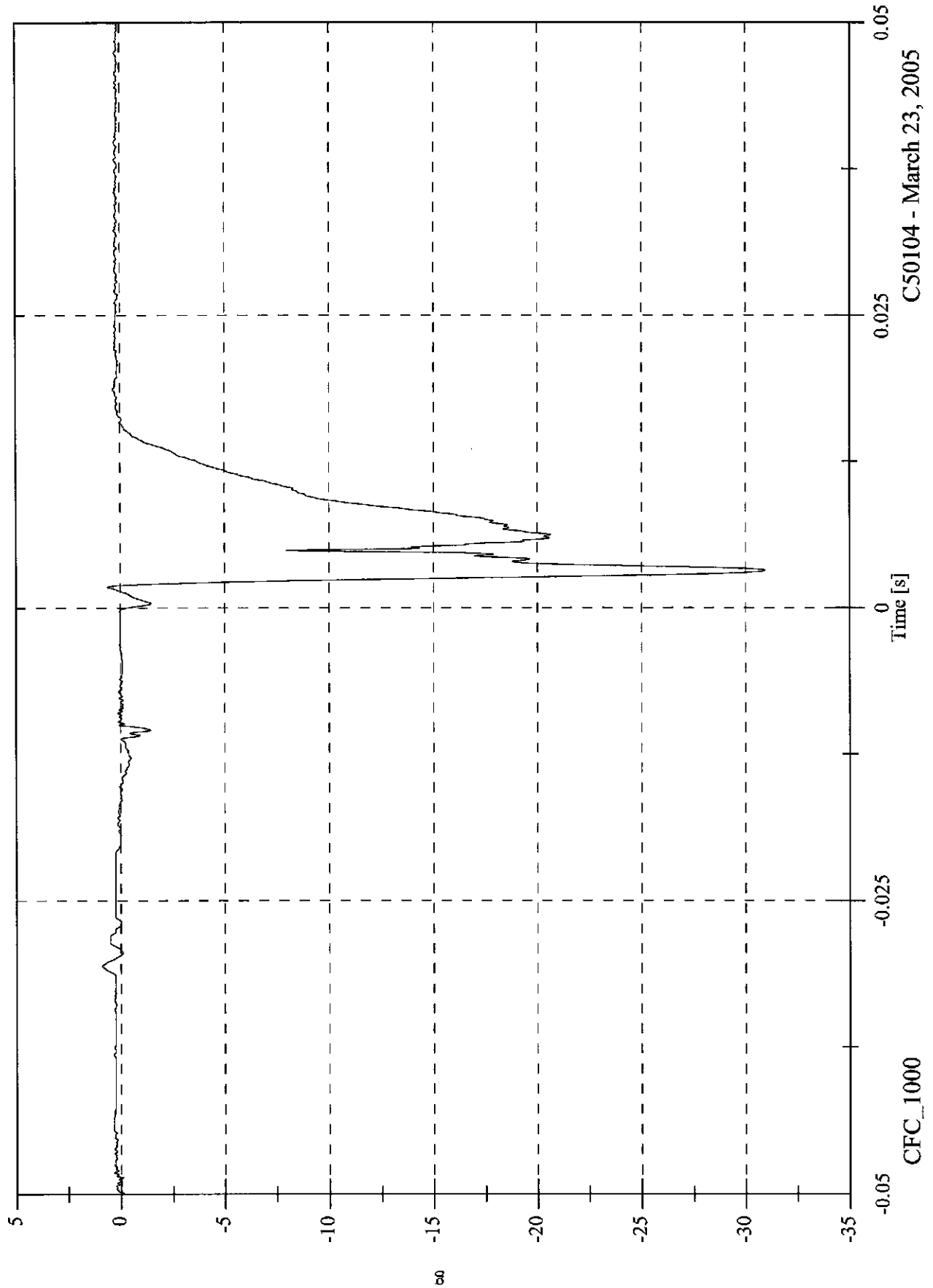
Max: 22.1 [g] at -0.031 [s]
Min: -136.8 [g] at 0.003 [s]



FMVSS 201U IMPACT TEST - 2005 Buick Lacrosse

Headform Y Acceleration

Max: 0.9 [g] at -0.031 [s]
Min: -30.9 [g] at 0.003 [s]



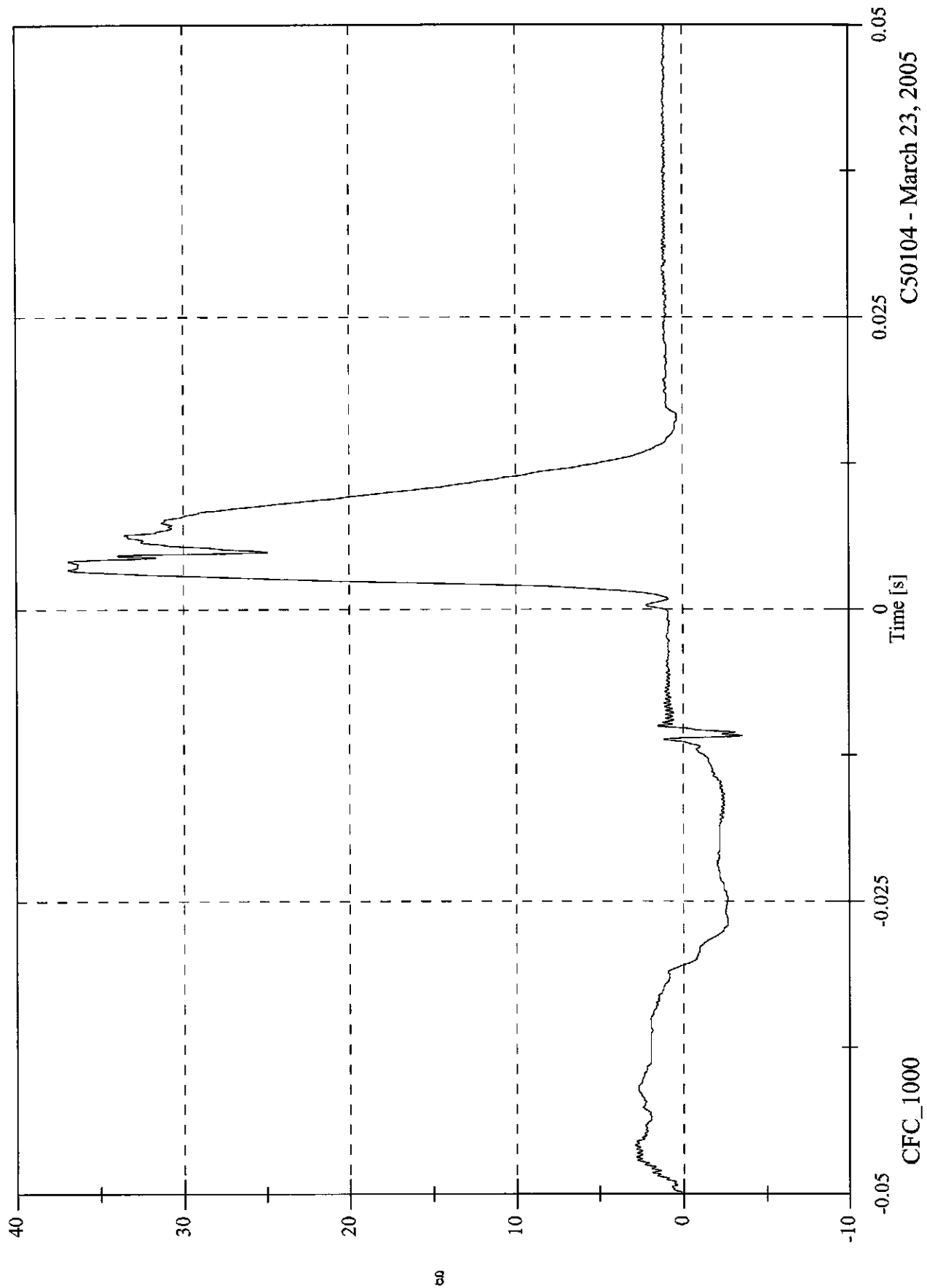
C50104 - March 23, 2005

FMVSS 201U IMPACT TEST - 2005 Buick Lacrosse

Headform Z Acceleration

Max: 36.9 [g] at 0.003 [s]

Min: -3.5 [g] at -0.011 [s]

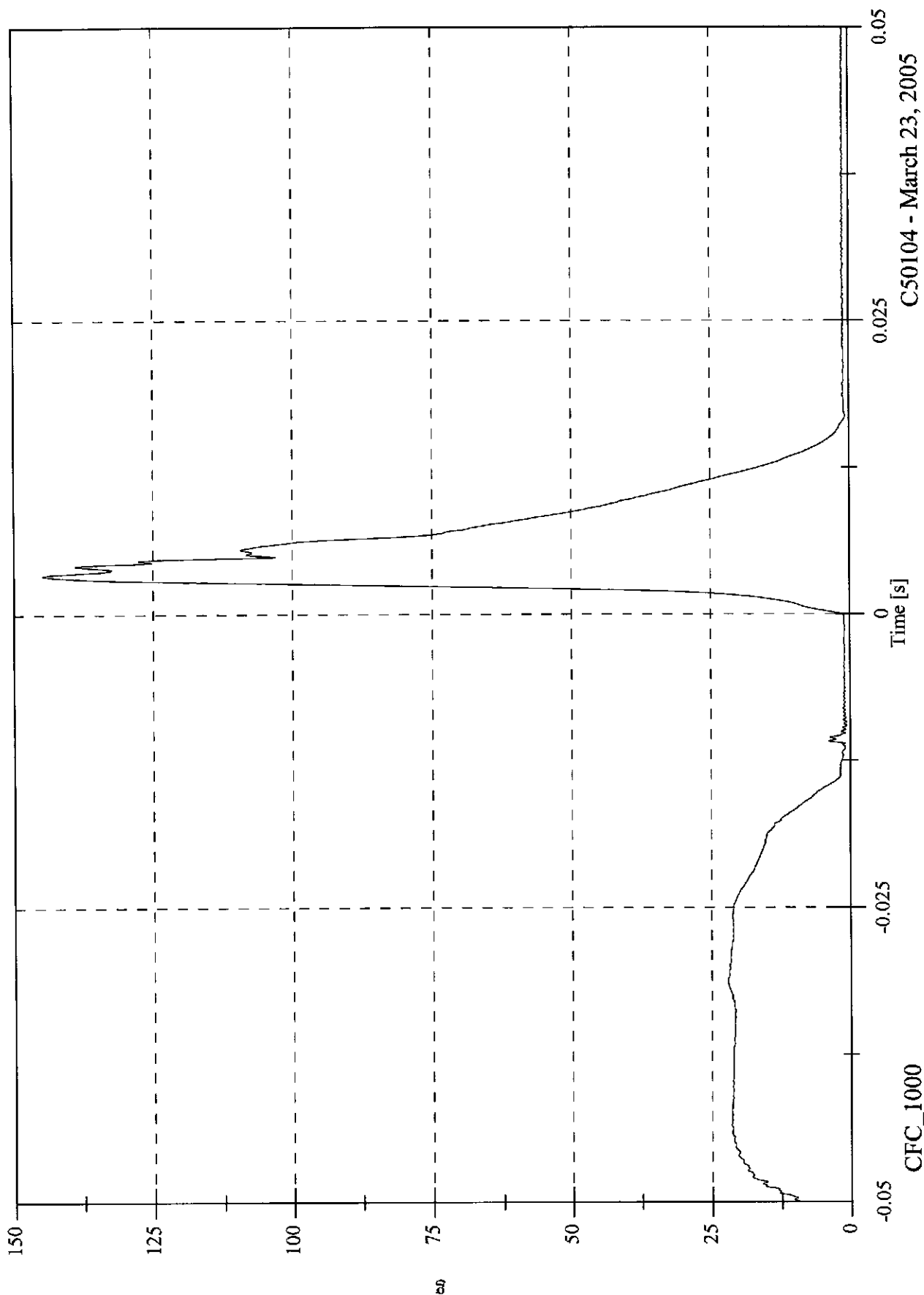


C50104 - March 23, 2005

FMVSS 201U IMPACT TEST - 2005 Buick Lacrosse

Headform Resultant

Max: 144.8 [g] at 0.003 [s]
Min: 0.6 [g] at -0.010 [s]

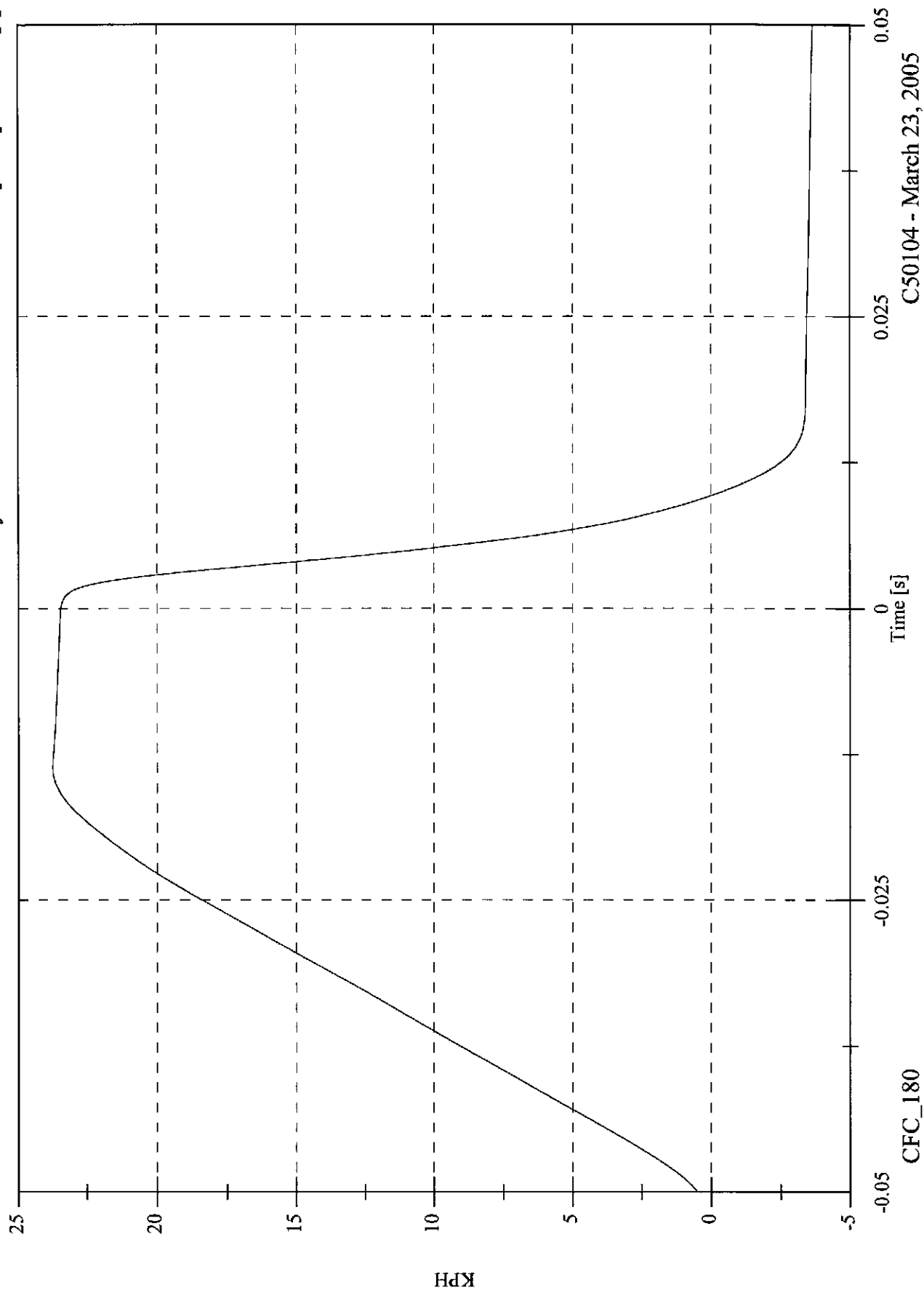


C50104 - March 23, 2005

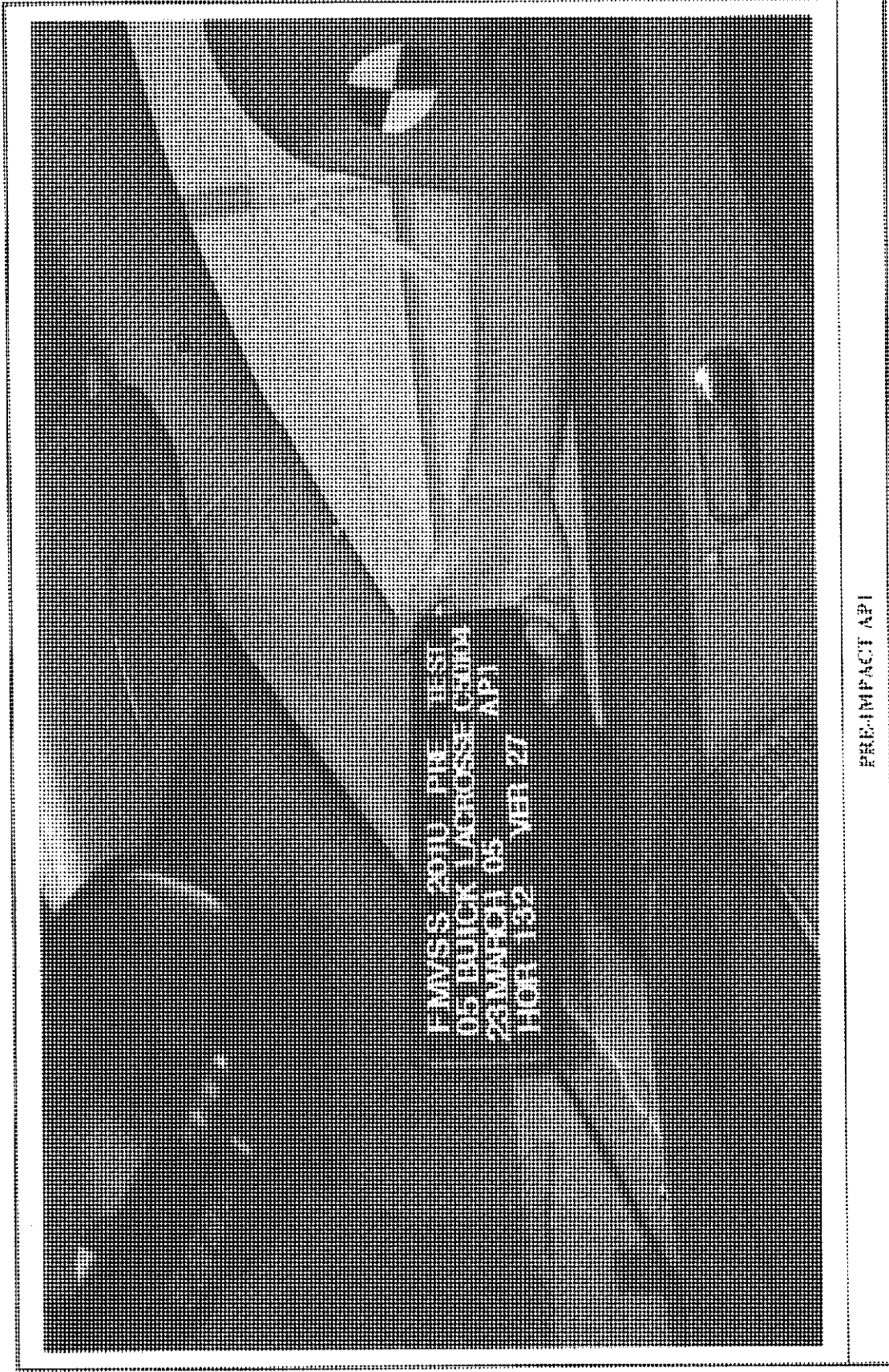
Max: 23.8 [KPH] at -0.014 [s]
Min: -3.6 [KPH] at 0.050 [s]

FMVSS 201U IMPACT TEST - 2005 Buick Lacrosse

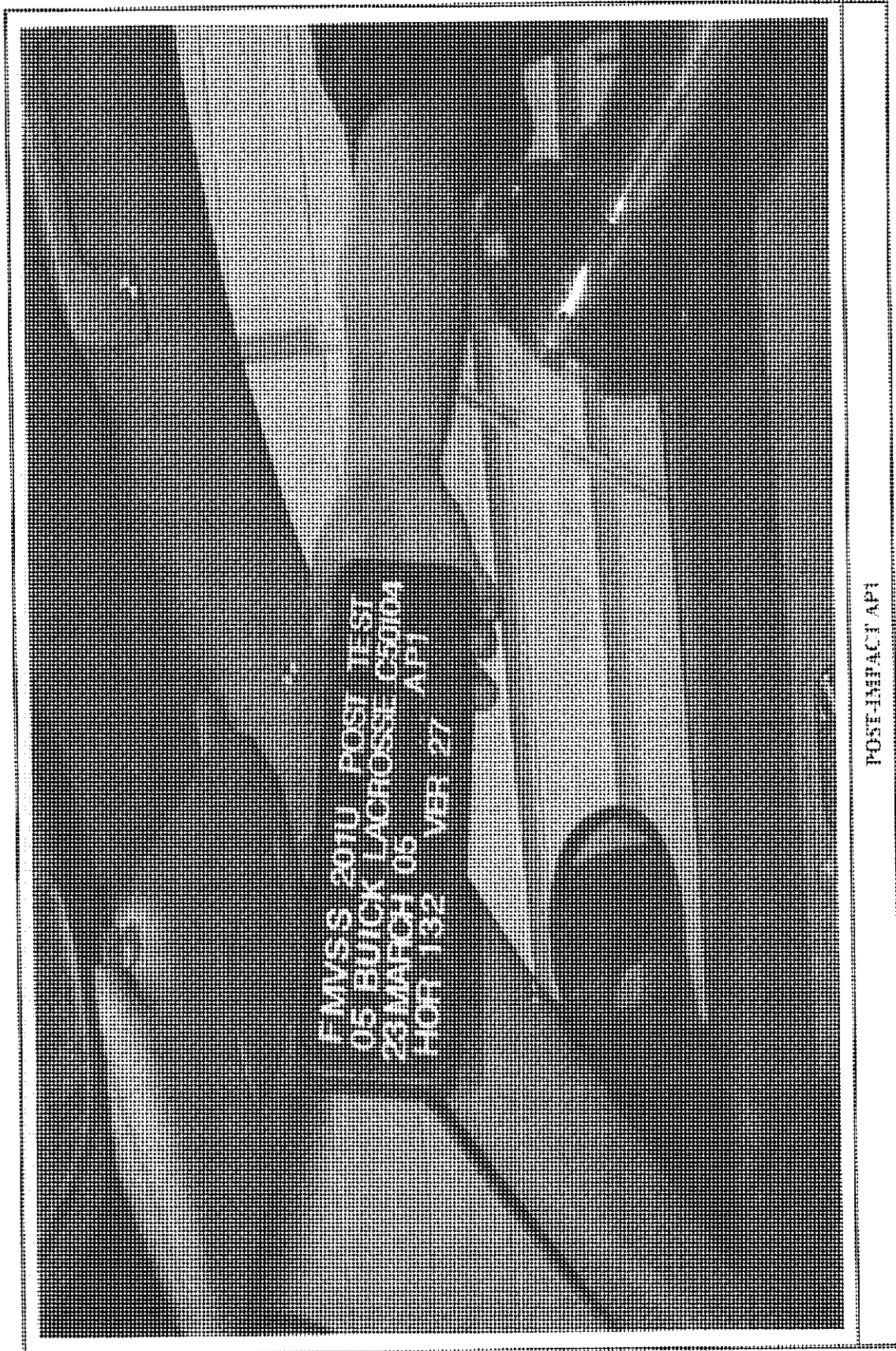
Headform Velocity



C50104 - March 23, 2005



PRE-IMPACT API



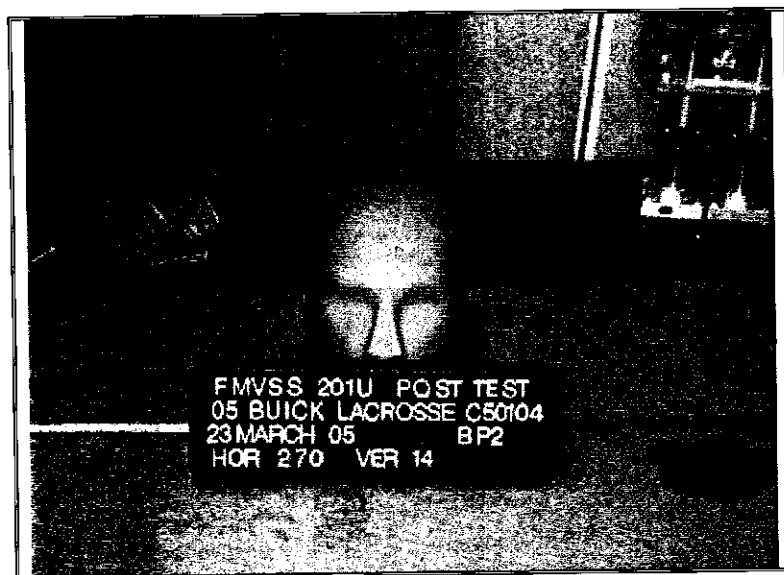
POST-IMPACT API

8754-FVH-04

VEHICLE YEAR/MAKE/MODEL/STYLE:	2005 Buick LaCrosse 4-Door Sedan
VIN:	2G4WC532451200267
DATE OF MANUFACTURE:	10/04(SEE CERTIFICATION LABEL)
COLOR:	Red

Test Number:	08
Test Date:	03/23/05
Target Location:	B-Pillar
Target Code:	BP2
Horizontal Impact Angle:	270°
Vertical Impact Angle:	14°
Ambient Temperature:	24.6C°
Relative Humidity:	16.7
Time of Impact:	15:30
Headform Number:	805

Impact Point Description (from lower midpoint on midsagittal line)			
On Centerline	17	<input type="checkbox"/> mm right	<input checked="" type="checkbox"/> mm left
On Centerline	12	mm up	



POST-IMPACT BP2 HEADFORM

Free Motion HIC	933.9
HIC(d)	871.0
Impact Velocity (kph)	23.83
HIC T1 (msec)	1.9
HIC T2 (msec)	7.4

FMVSS 201U IMPACT TEST - 2005 Buick Lacrosse C50104 - BP2

FMH Headform 805

Location: BP2

Test Date: March 23, 2005

Work File: BP2

-----TEST RESULTS-----

Lab Temperature: 24.6 C

HICd: 871.0

Lab Humidity: 16.7 %

HIC (36ms): 933.9

Velocity at Impact: 23.84 KPH

t1: 1.9 msec

t2: 7.4 msec

Free Flight Distance: 214.95 mm

Duration: 5.5 msec

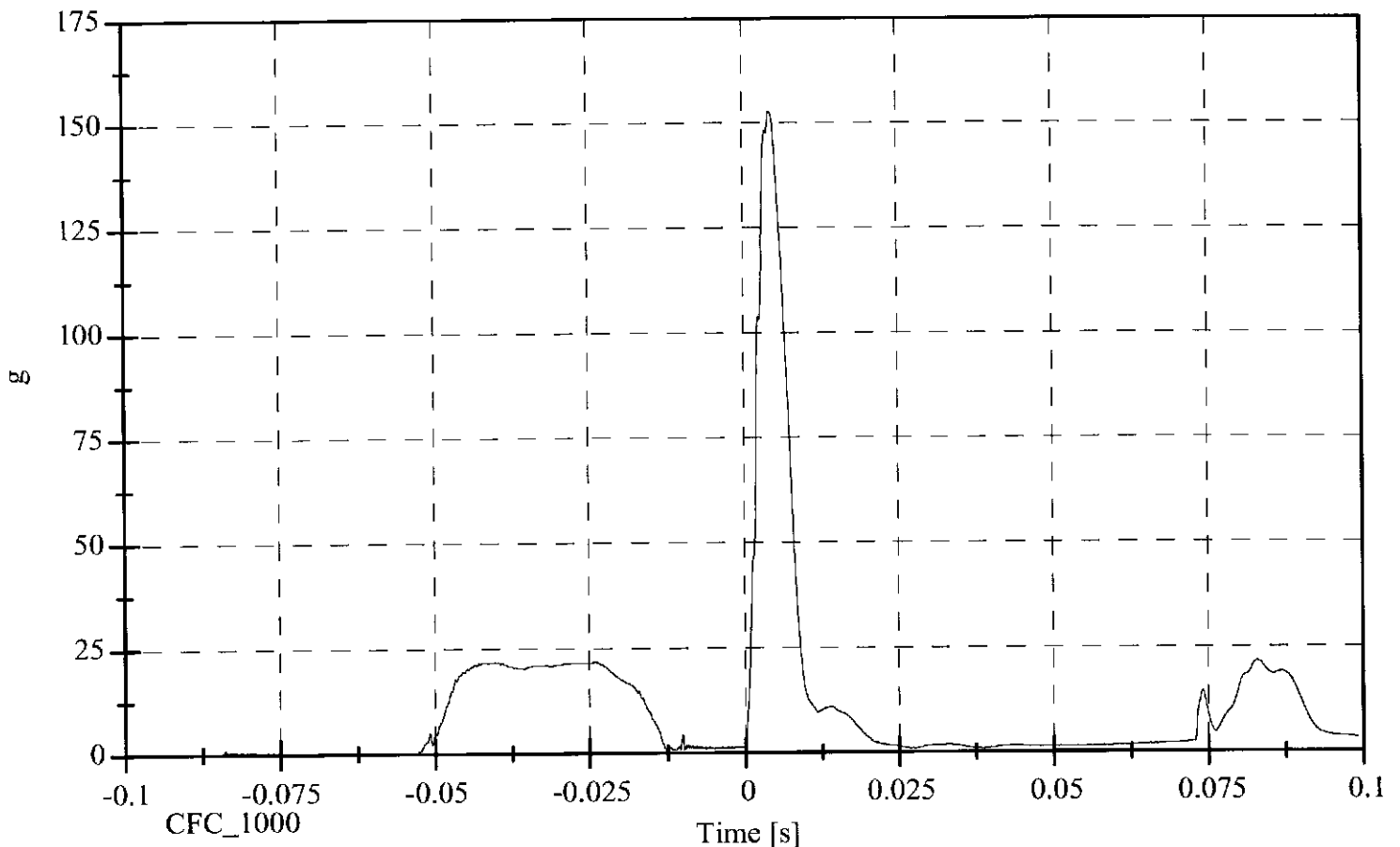
Maximum: 152.8 g

Average Acceleration: 10.0 g

FMVSS 201U IMPACT TEST - 2005 Buick Lacrosse
Headform Resultant

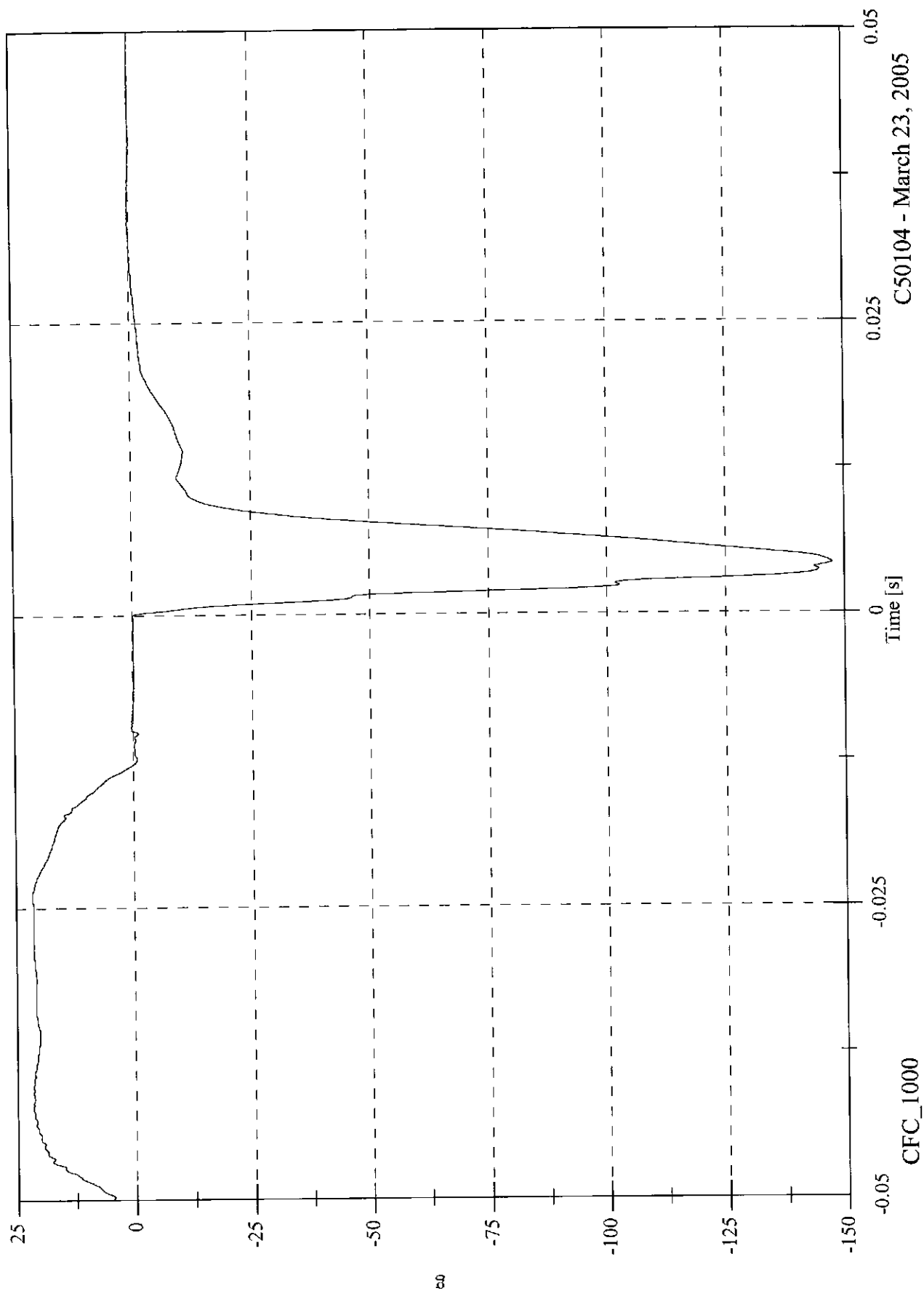
Max: 152.8 [g] at 0.004 [s]

Min: 0.0 [g] at -0.088 [s]



Max: 21.6 [g] at -0.042 [s]
Min: -147.3 [g] at 0.004 [s]

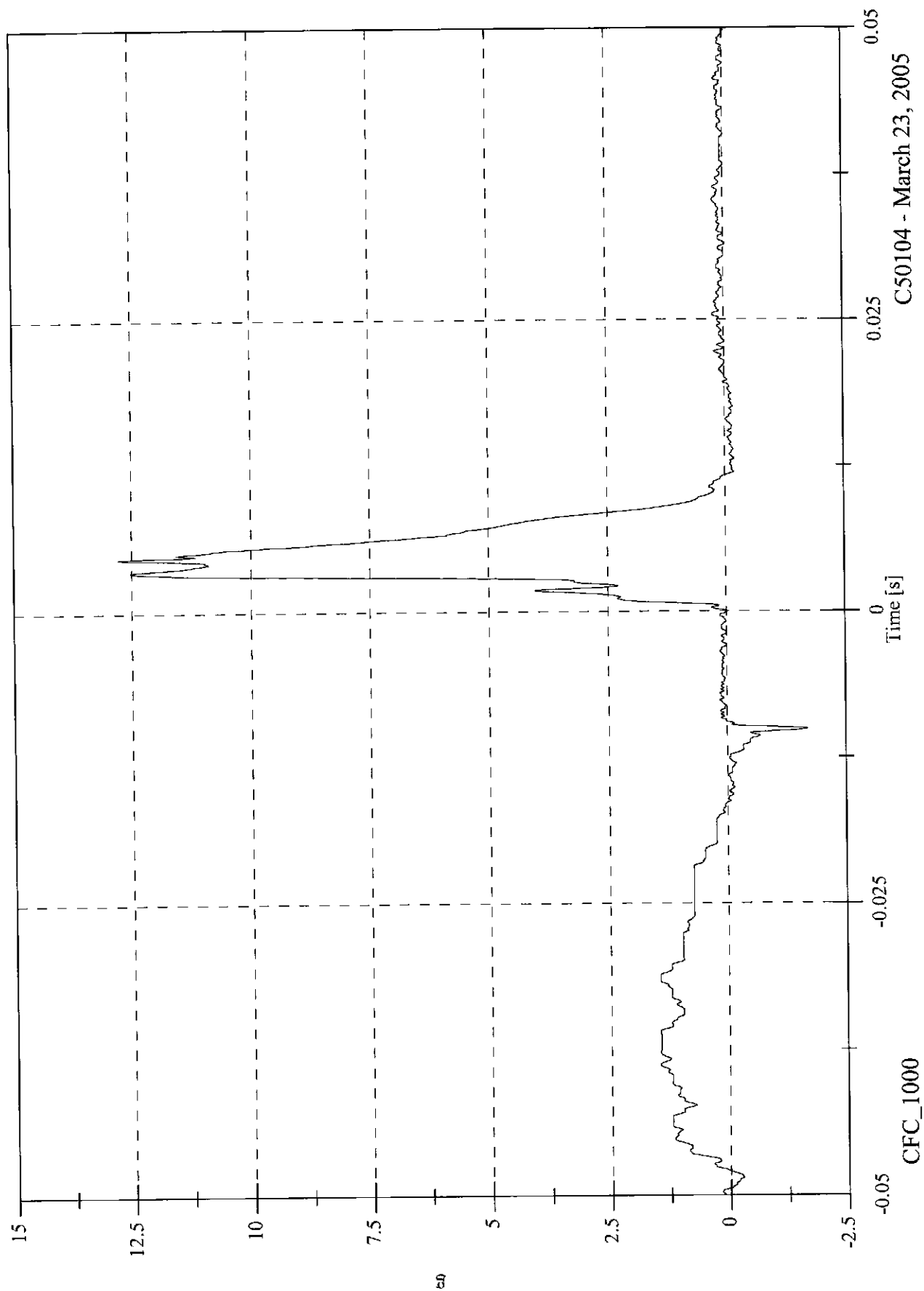
FMVSS 201U IMPACT TEST - 2005 Buick Lacrosse
Headform X Acceleration



C50104 - March 23, 2005

FMVSS 201U IMPACT TEST - 2005 Buick Lacrosse
Headform Y Acceleration

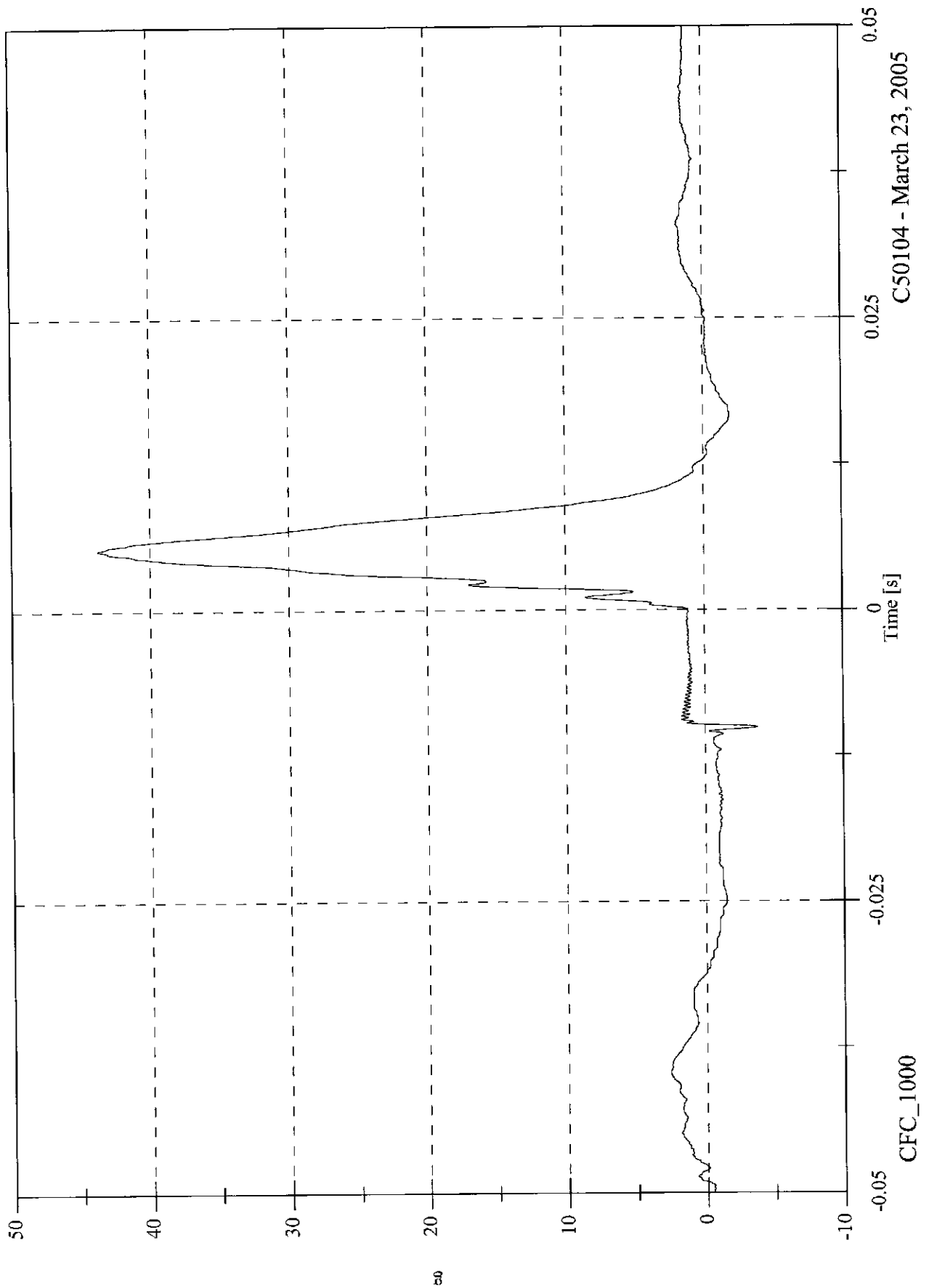
Max: 12.8 [g] at 0.005 [s]
Min: -1.7 [g] at -0.010 [s]



C50104 - March 23, 2005

FMVSS 201U IMPACT TEST - 2005 Buick Lacrosse
Headform Z Acceleration

Max: 43.8 [g] at 0.005 [s]
Min: -3.8 [g] at -0.010 [s]

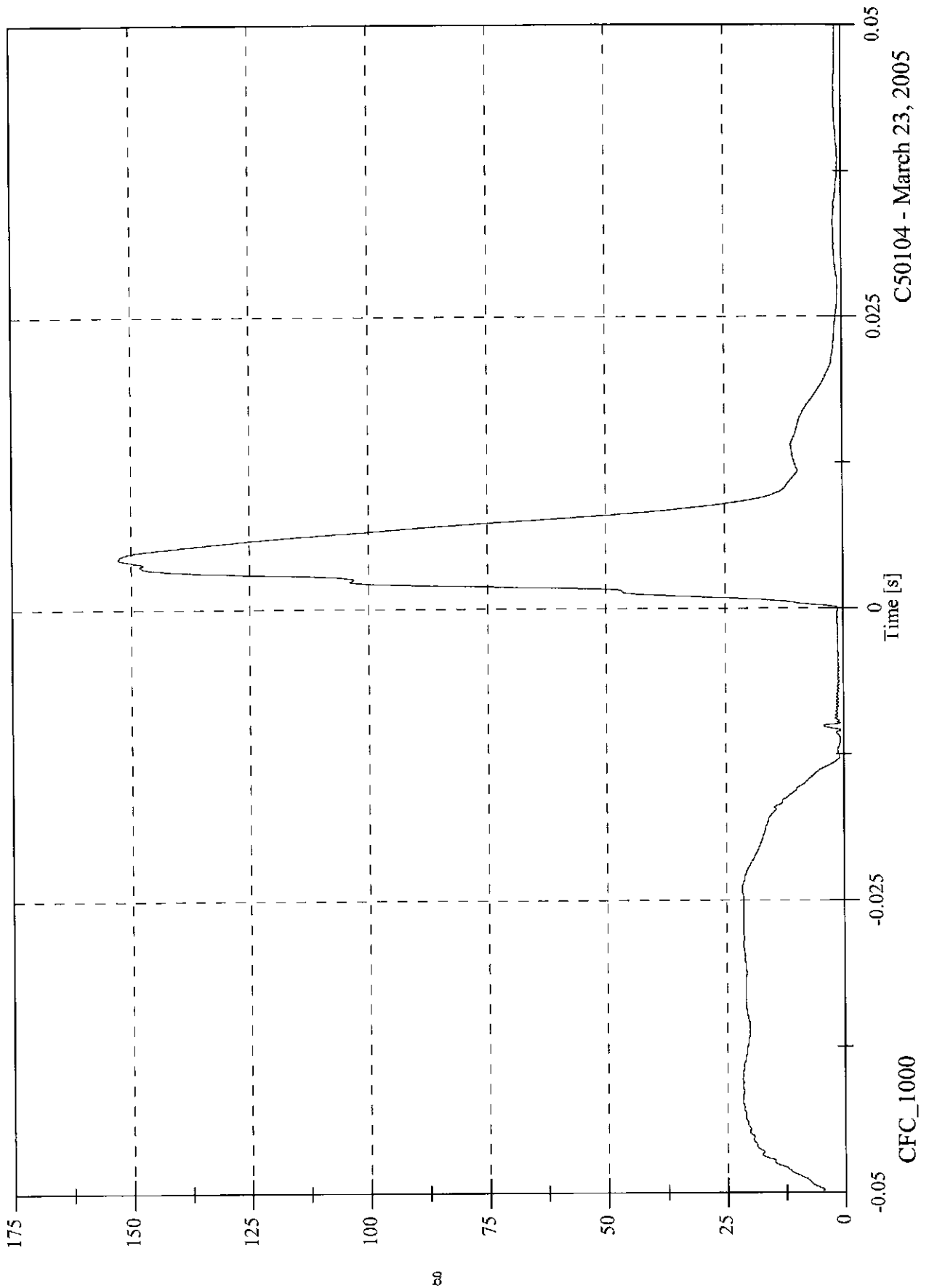


C50104 - March 23, 2005

FMVSS 201U IMPACT TEST - 2005 Buick Lacrosse

Headform Resultant

Max: 152.8 [g] at 0.004 [s]
Min: 0.6 [g] at -0.010 [s]



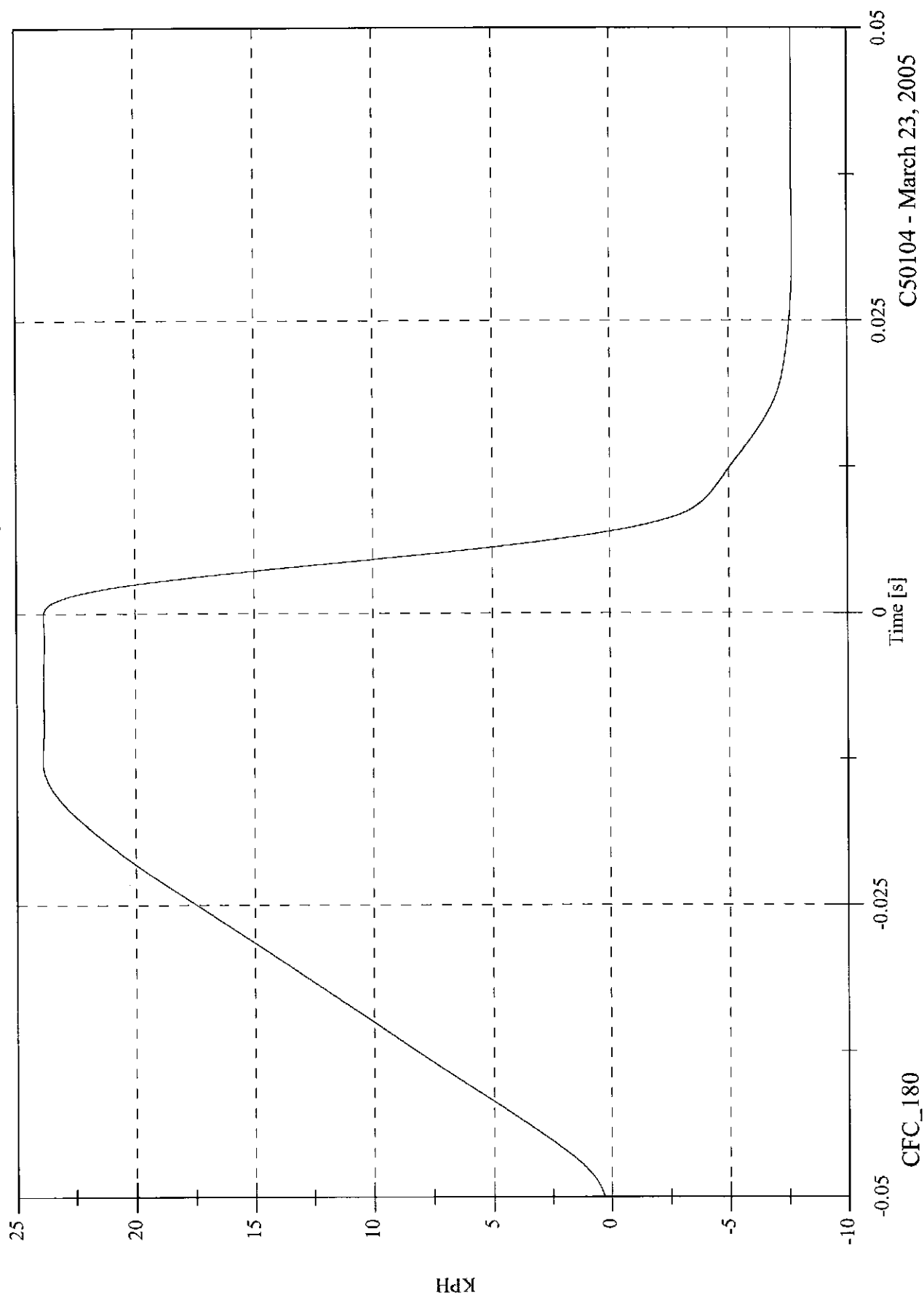
FMVSS 201U IMPACT TEST - 2005 Buick Lacrosse

Headform Velocity

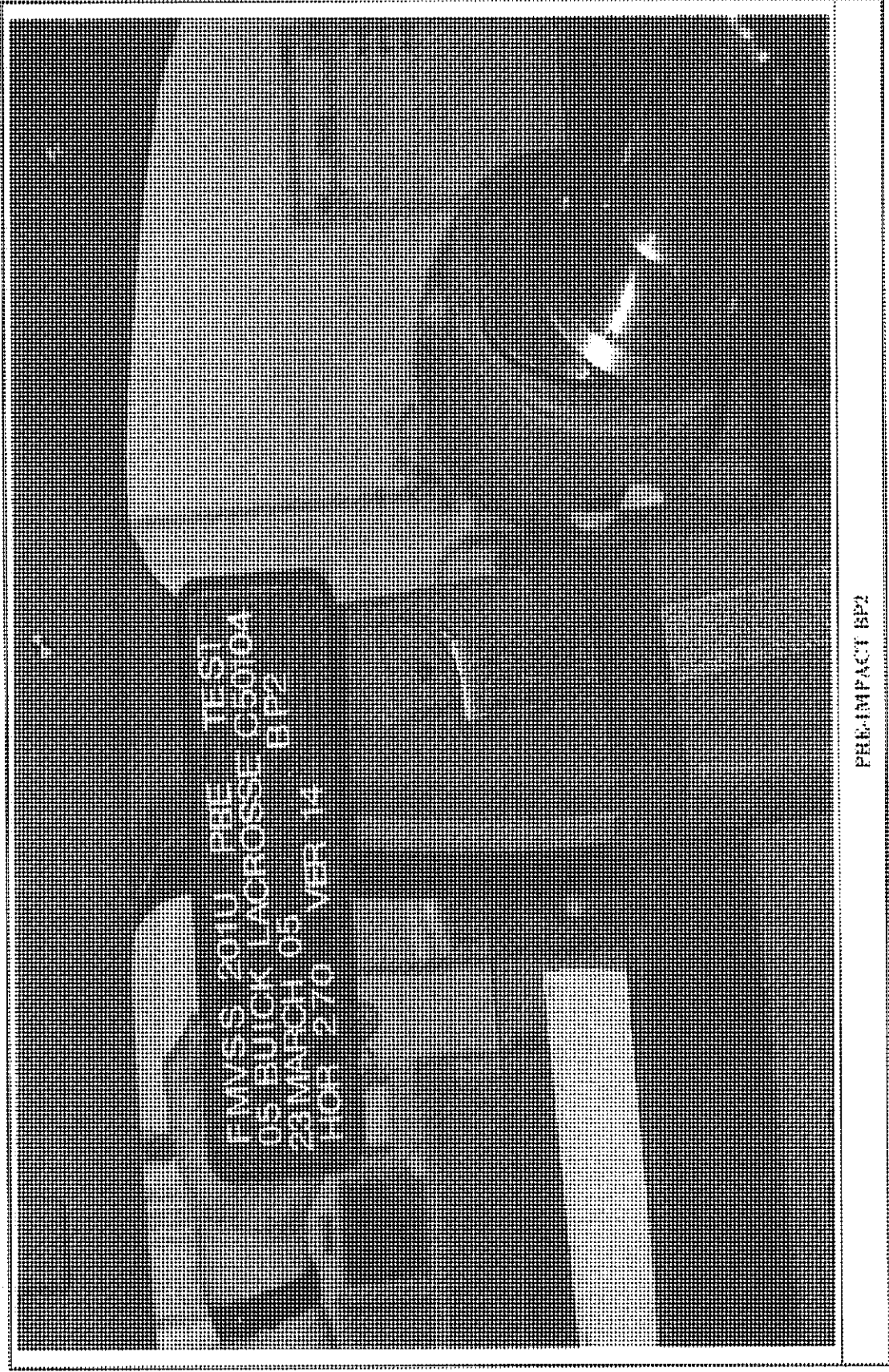
Max: 23.9 [KPH] at -0.013 [s]

Min: -7.7 [KPH] at 0.032 [s]

Time [s]



C50104 - March 23, 2005



PRE-IMPACT BP2



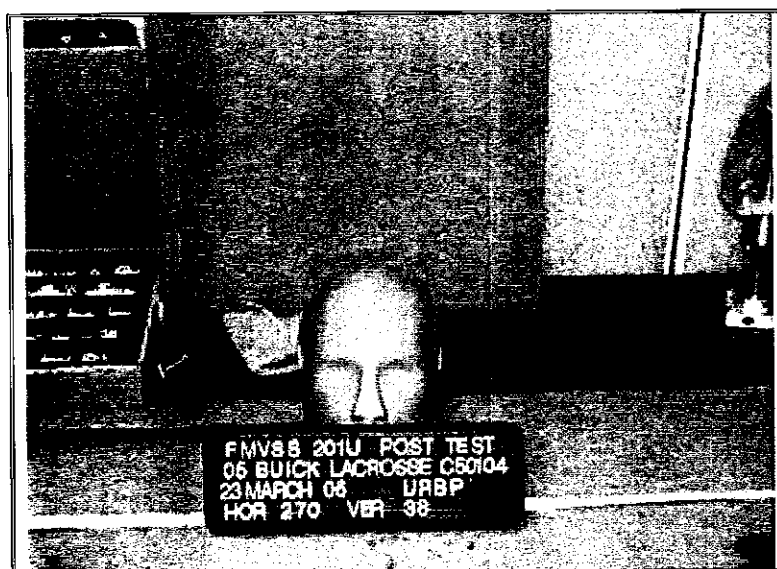
POST-IMPACT BPI

8754-FMH-04

VEHICLE YEAR/MAKE/MODEL/STYLE:	2005 Buick LaCrosse 4-Door Sedan
VIN:	2G4WC532451200267
DATE OF MANUFACTURE:	10/04(SEE CERTIFICATION LABEL)
COLOR:	Red

Test Number:	09
Test Date:	03/23/05
Target Location:	Upper Roof
Target Code:	URBP
Horizontal Impact Angle:	270°
Vertical Impact Angle:	38°
Ambient Temperature:	24.4C°
Relative Humidity:	17
Time of Impact:	16:15
Headform Number:	1255

Impact Point Description (from lower midpoint on midsagittal line)			
On Centerline	15	mm right	x mm left
On Centerline	58	mm up	



POST-IMPACT URBP HEADFORM

Free Motion HIC	1233.1
HIC(d)	1096.7
Impact Velocity (kph)	23.6
HIC T1 (msec)	3.1
HIC T2 (msec)	7.7

FMVSS 201U IMPACT TEST - 2005 Buick Lacrosse C50104 - URBP

FMH Headform 1255

Location: URBP

Test Date: March 23, 2005

Work File: URBP

TEST RESULTS

Lab Temperature: 24.4 C

HICd: 1096.7

Lab Humidity: 17.0 %

HIC (36ms): 1233.1

Velocity at Impact: 23.60 KPH

t1: 3.1 msec

t2: 7.7 msec

Free Flight Distance: 218.66 mm

Duration: 4.6 msec

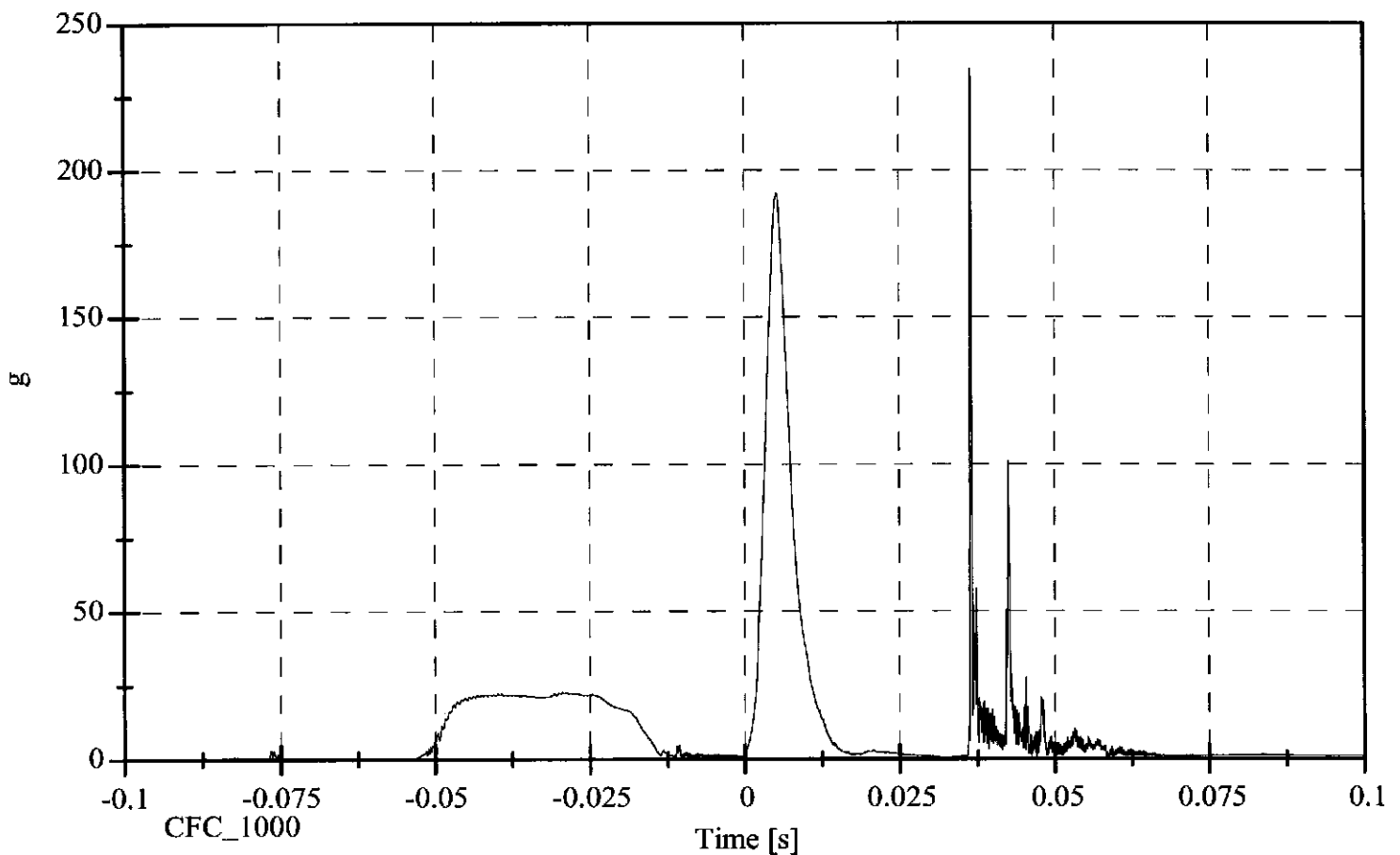
Maximum: 191.9 g

Average Acceleration: 10.3 g

FMVSS 201U IMPACT TEST - 2005 Buick Lacrosse
Headform Resultant

Max: 191.9 [g] at 0.005 [s]

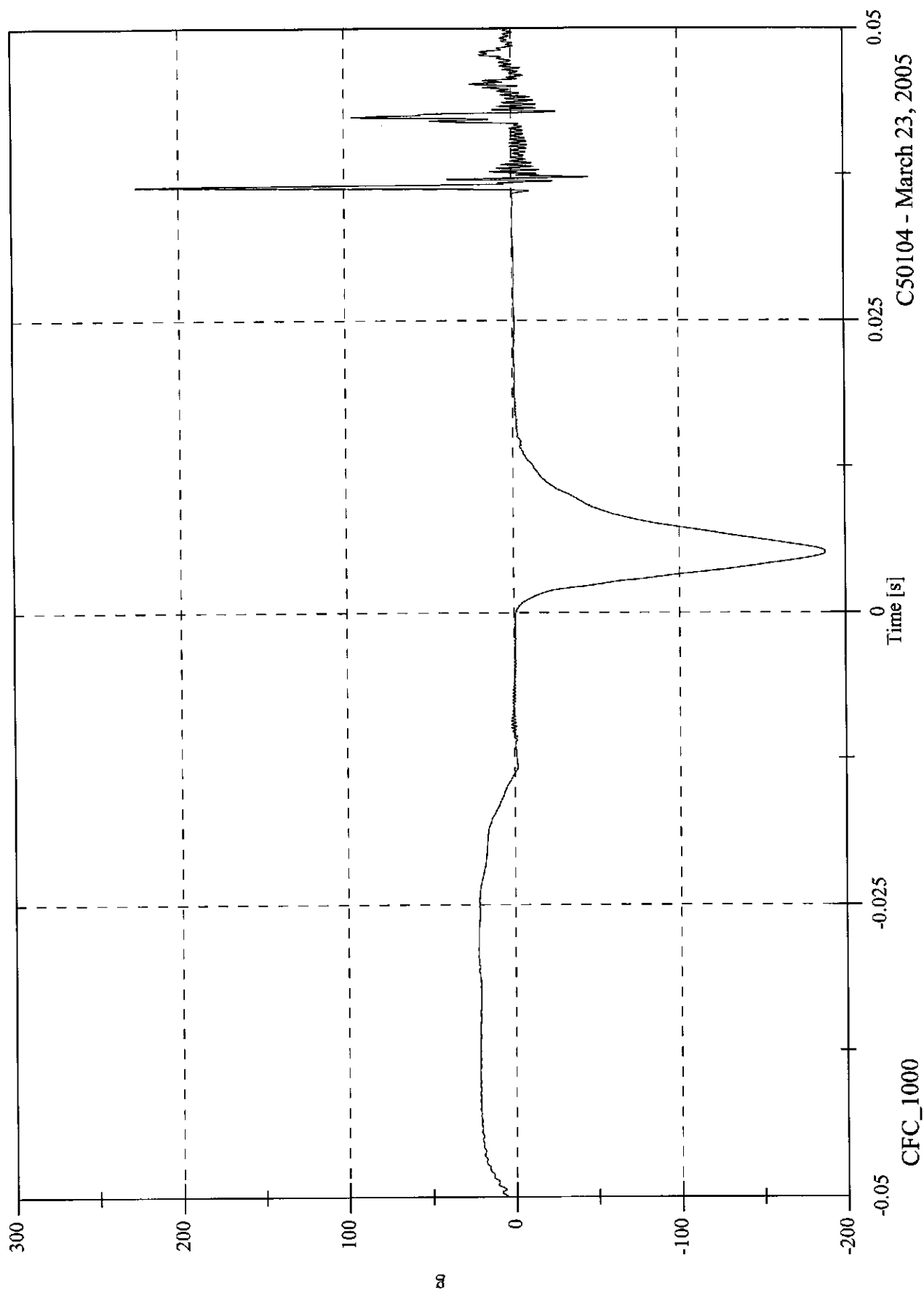
Min: 0.0 [g] at -0.085 [s]



Max: 225.3 [g] at 0.036 [s]
Min: -187.8 [g] at 0.005 [s]

Headform X Acceleration

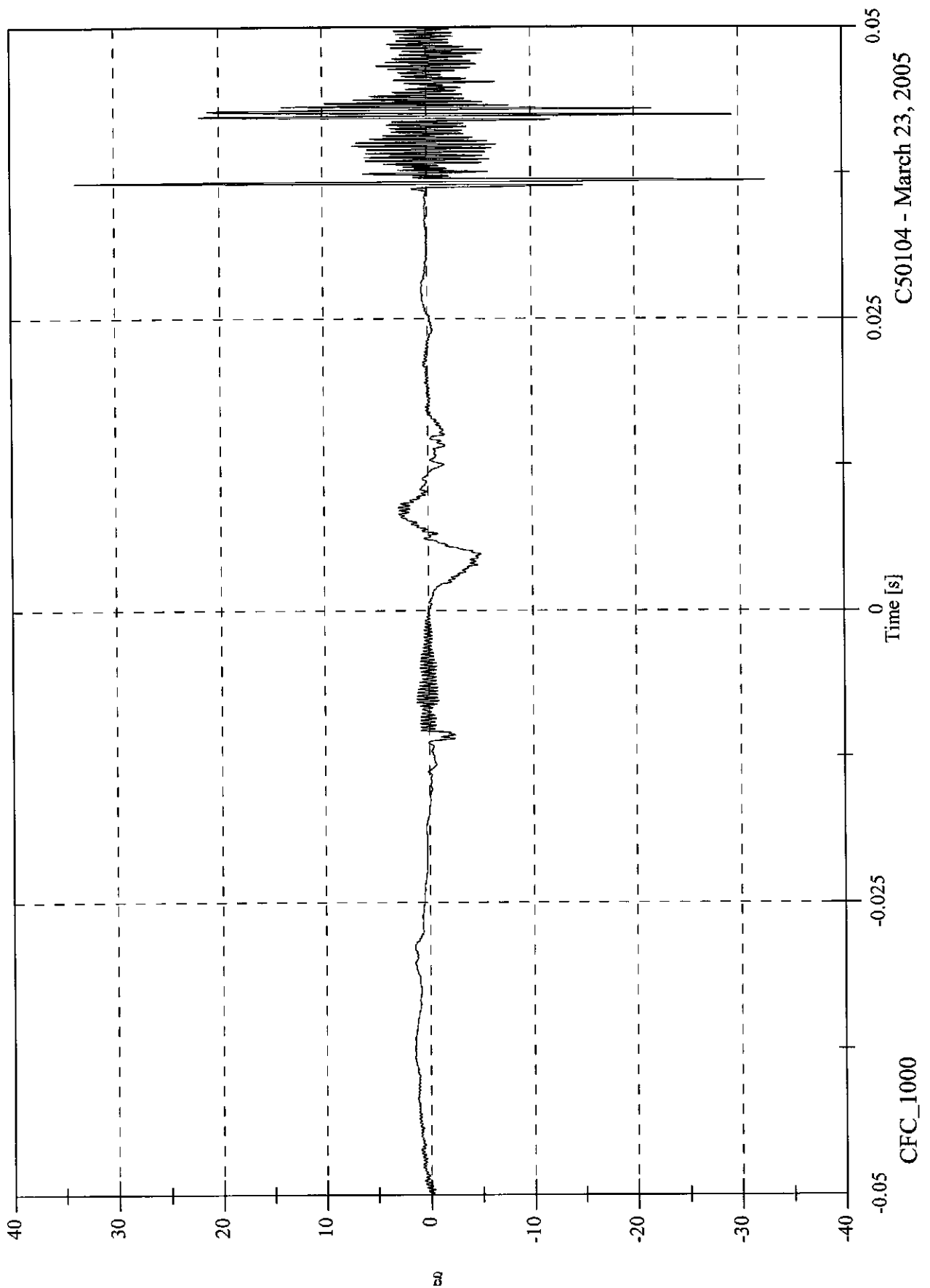
FMVSS 201U IMPACT TEST - 2005 Buick Lacrosse



C50104 - March 23, 2005

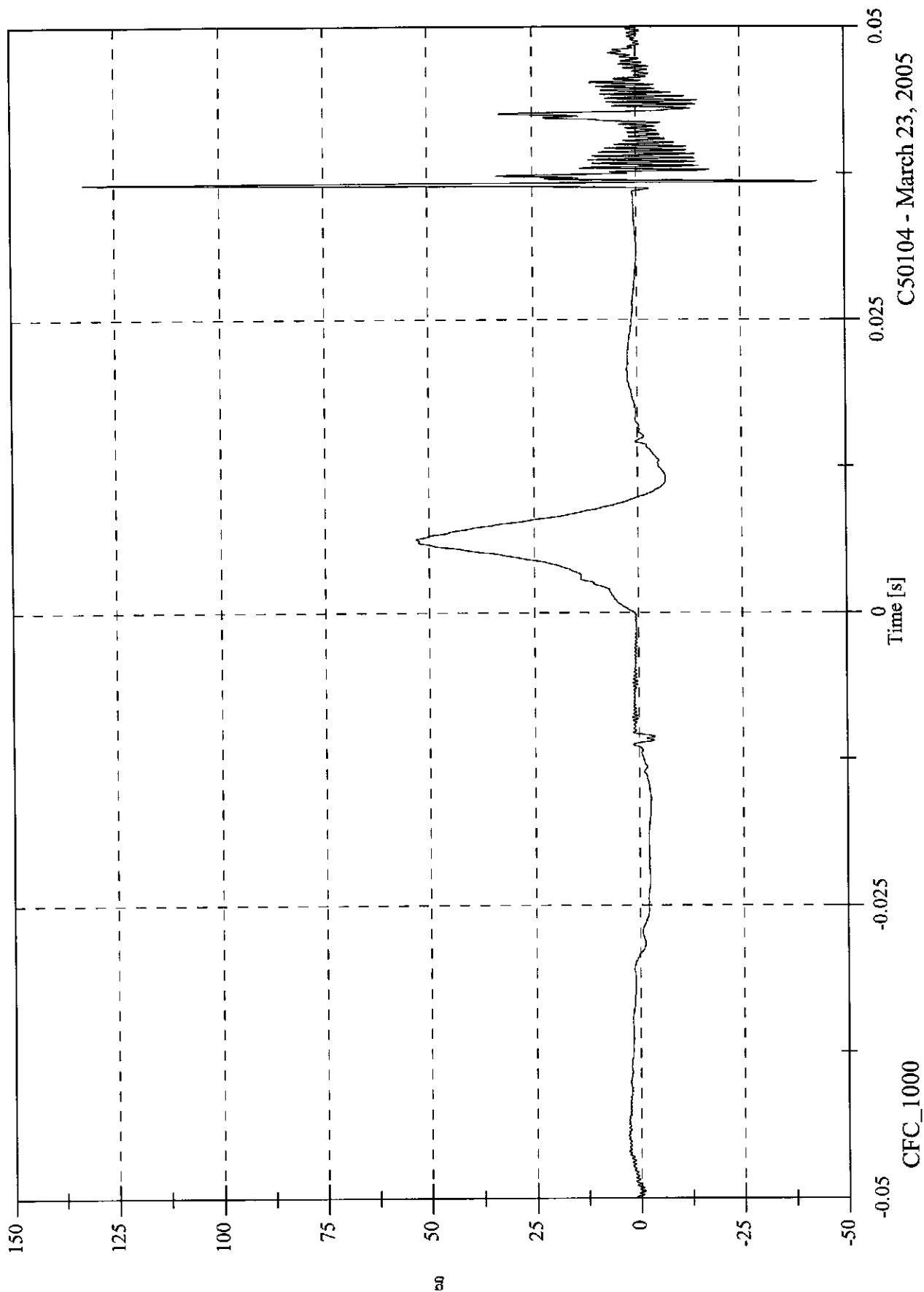
FMVSS 201U IMPACT TEST - 2005 Buick Lacrosse
Headform Y Acceleration

Max: 33.7 [g] at 0.037 [s]
Min: -32.6 [g] at 0.037 [s]



FMVSS 201U IMPACT TEST - 2005 Buick Lacrosse
Headform Z Acceleration

Max: 132.4 [g] at 0.037 [s]
Min: -43.5 [g] at 0.037 [s]

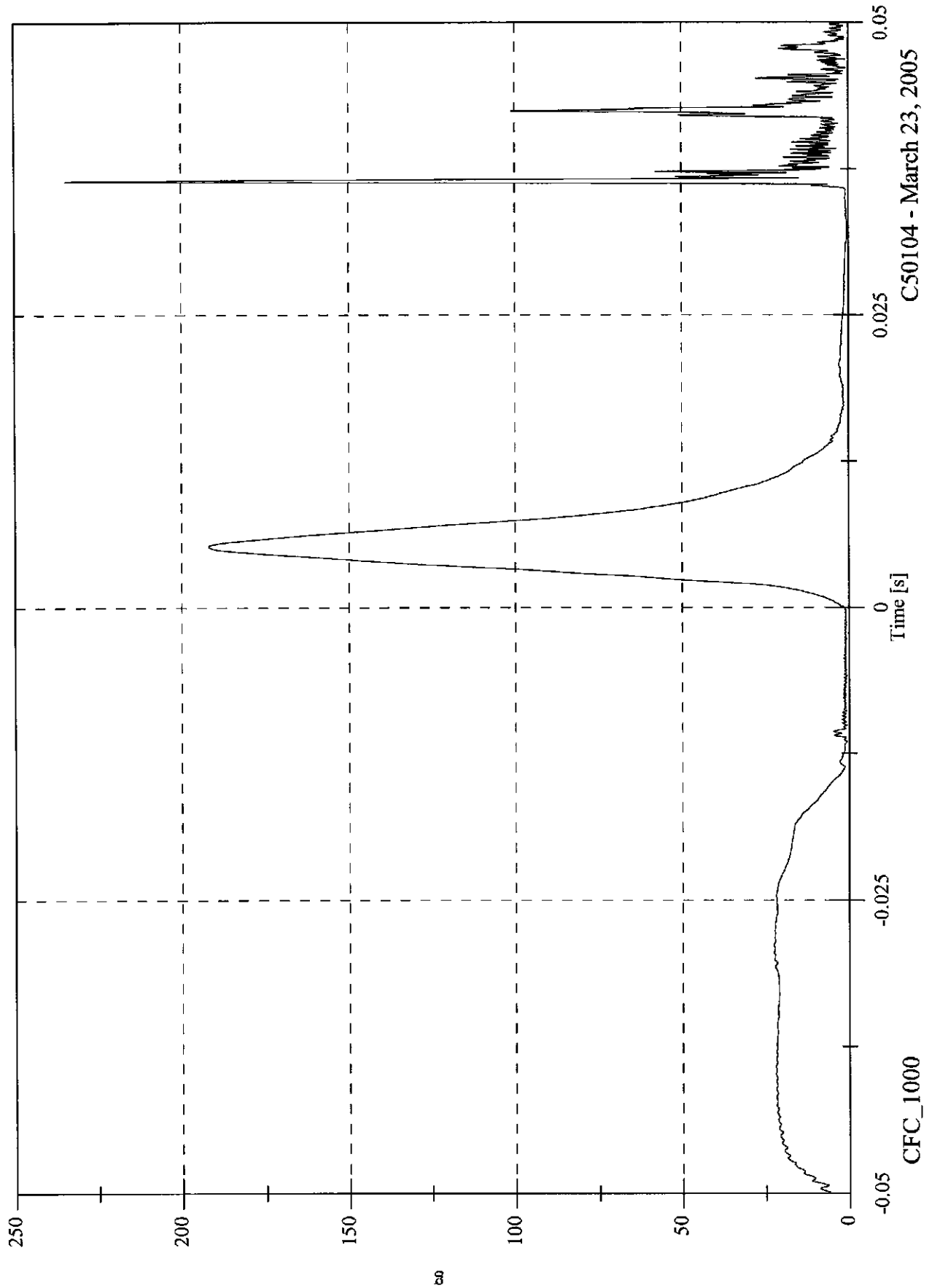


C50104 - March 23, 2005

FMVSS 201U IMPACT TEST - 2005 Buick Lacrosse

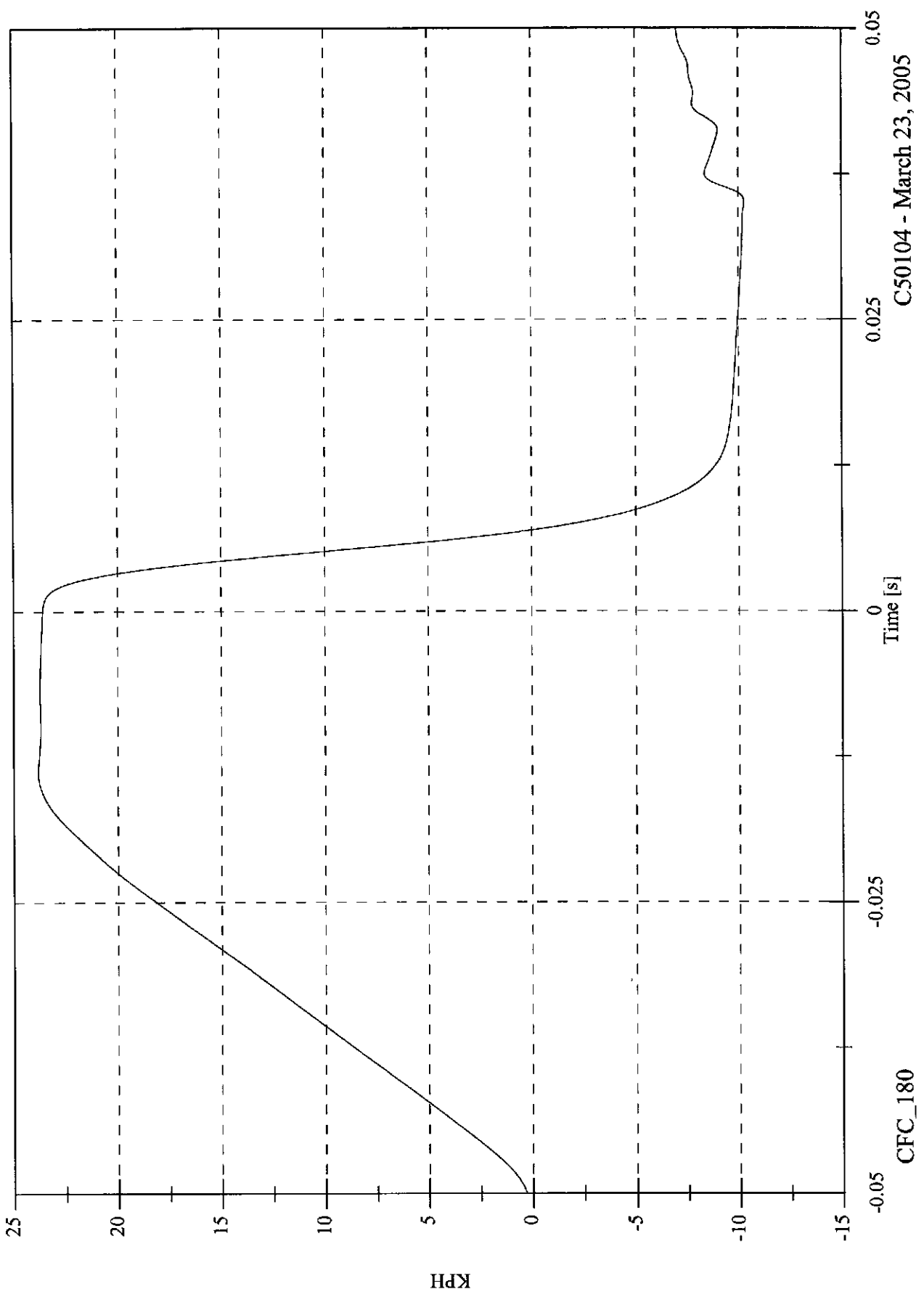
Headform Resultant

Max: 234.7 [g] at 0.036 [s]
Min: 0.4 [g] at 0.032 [s]



C50104 - March 23, 2005

FMVSS 201U IMPACT TEST - 2005 Buick Lacrosse
Headform Velocity
Max: 23.8 [KPH] at -0.014 [s]
Min: -10.3 [KPH] at 0.035 [s]





PRE-IMPACT URBP

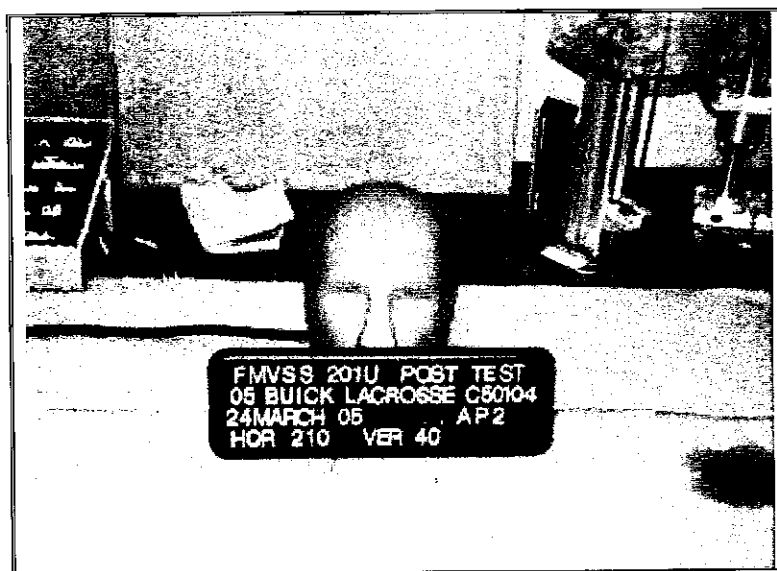


POST-IMPACT URB

VEHICLE YEAR/MAKE/MODEL/STYLE:	2005 Buick LaCrosse 4-Door Sedan
VIN:	2G4WC532451200267
DATE OF MANUFACTURE:	10/04(SEE CERTIFICATION LABEL)
COLOR:	Red

Test Number:	10
Test Date:	03/24/05
Target Location:	A-Pillar
Target Code:	AP2
Horizontal Impact Angle:	210°
Vertical Impact Angle:	40°
Ambient Temperature:	24.3C°
Relative Humidity:	19.5
Time of Impact:	9:20
Headform Number:	355

Impact Point Description (from lower midpoint on midsagittal line)			
On Centerline	24	<input checked="" type="checkbox"/> mm right	<input type="checkbox"/> mm left
On Centerline	35	mm up	



POST-IMPACT AP2 HEADFORM

Free Motion HIC	800.1
HIC(d)	770.1
Impact Velocity (kph)	23.72
HIC T1 (msec)	4.9
HIC T2 (msec)	8.1

FMVSS 201U IMPACT TEST - 2005 Buick Lacrosse C50104 - AP2

FMH Headform 0355

Location: AP2

Test Date: March 24, 2005

Work File: AP2

-----TEST RESULTS-----

Lab Temperature: 24.3 C

HICd: 770.1

Lab Humidity: 19.5 %

HIC (36ms): 800.1

Velocity at Impact: 23.72 KPH

t1: 4.9 msec

t2: 8.1 msec

Free Flight Distance: 222.65 mm

Duration: 3.2 msec

Maximum: 184.7 g

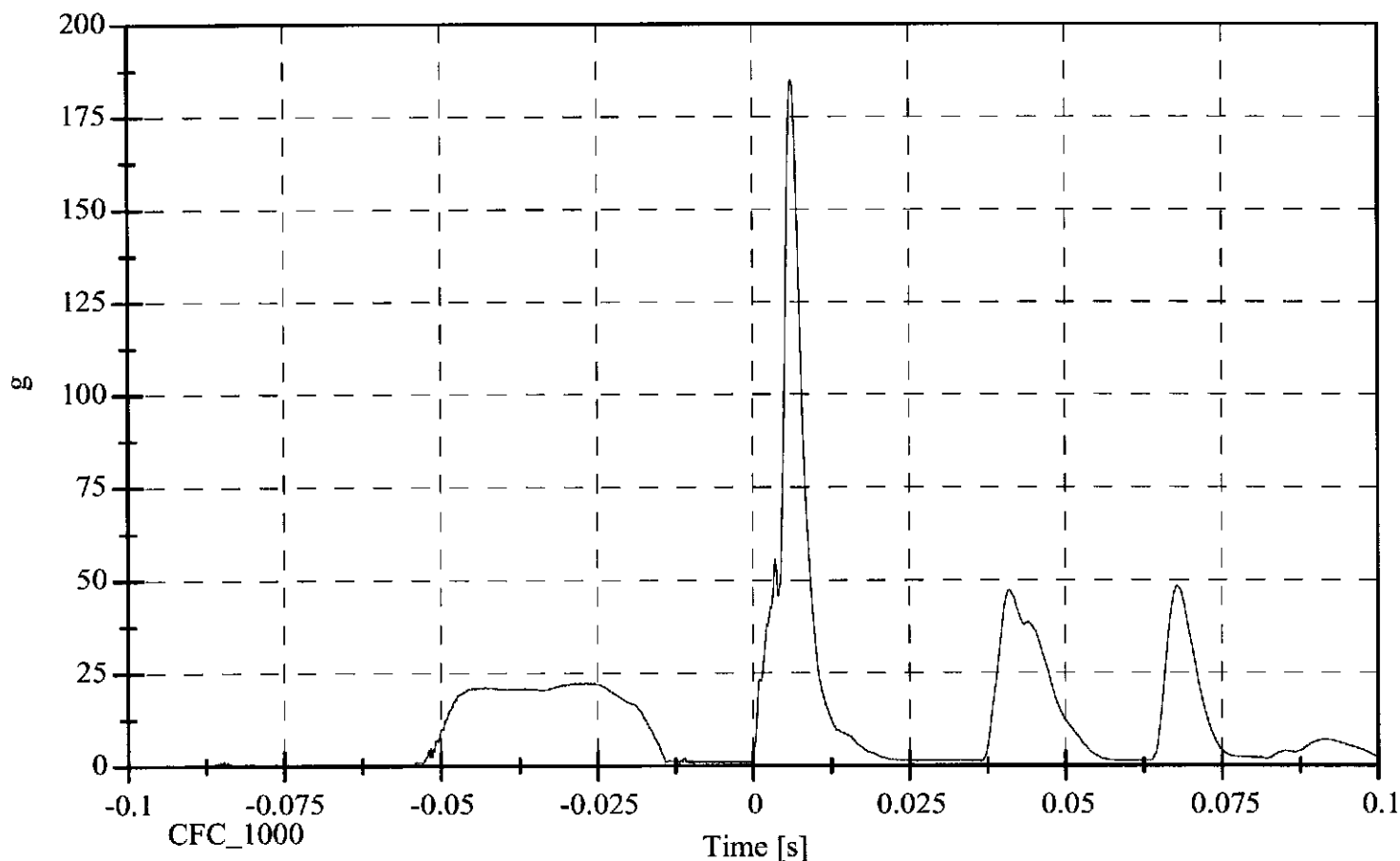
Average Acceleration: 11.9 g

FMVSS 201U IMPACT TEST - 2005 Buick Lacrosse

Max: 184.7 [g] at 0.006 [s]

Headform Resultant

Min: 0.0 [g] at -0.057 [s]

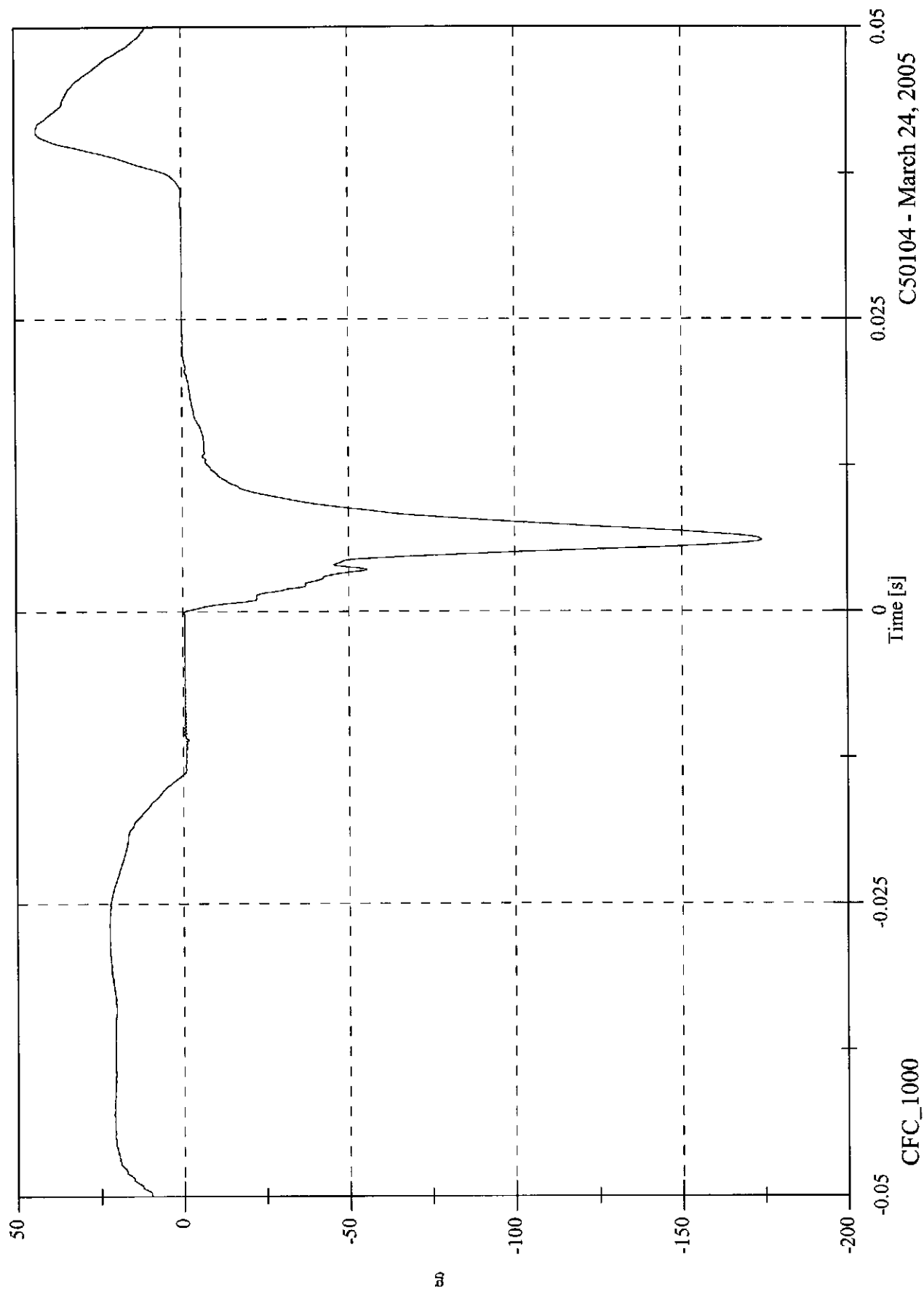


FMVSS 201U IMPACT TEST - 2005 Buick Lacrosse

Headform X Acceleration

Max: 43.5 [g] at 0.041 [s]

Min: -174.1 [g] at 0.006 [s]



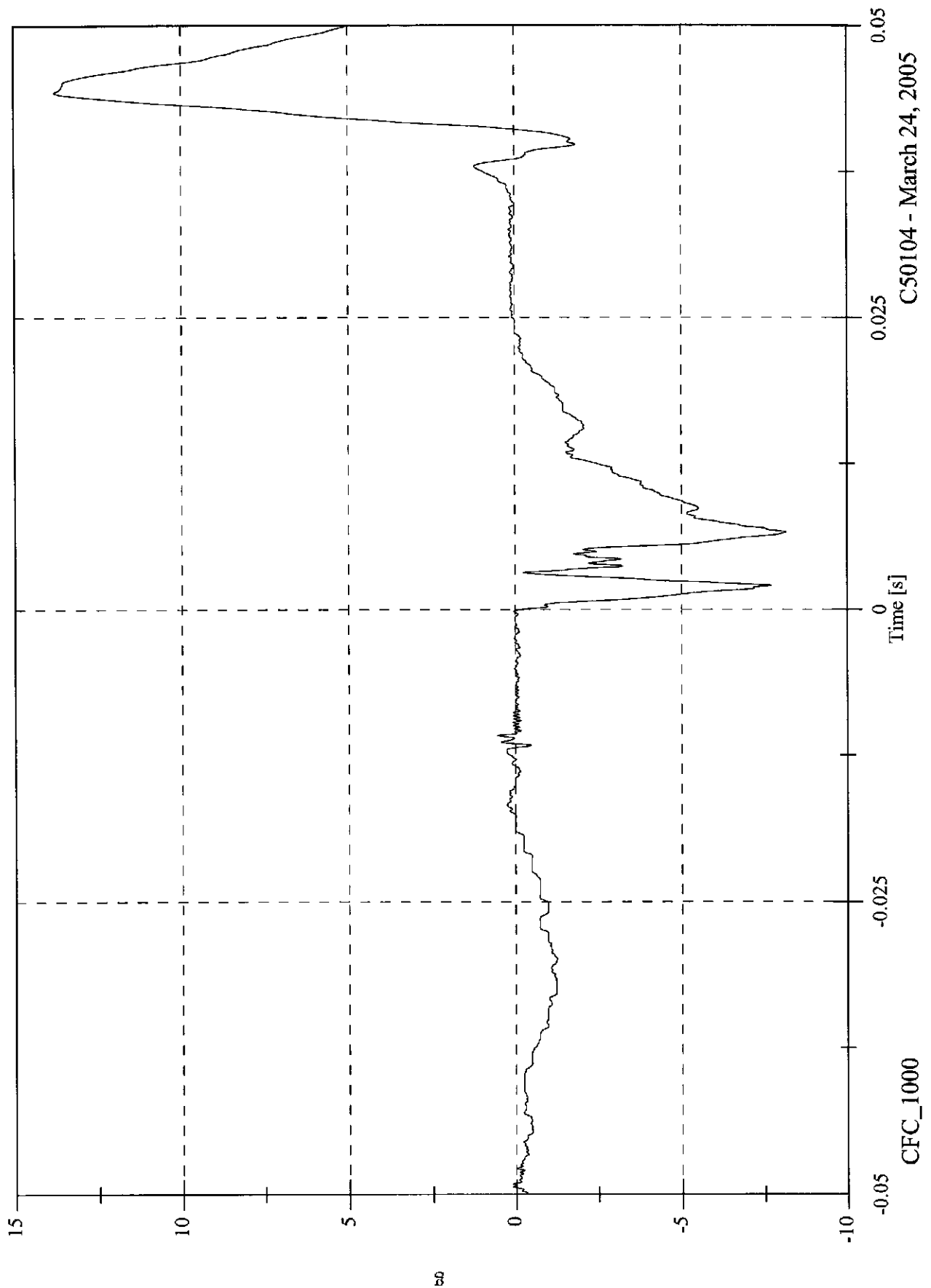
C50104 - March 24, 2005

FMVSS 201U IMPACT TEST - 2005 Buick Lacrosse

Headform Y Acceleration

Max: 13.8 [g] at 0.044 [s]

Min: -8.2 [g] at 0.007 [s]



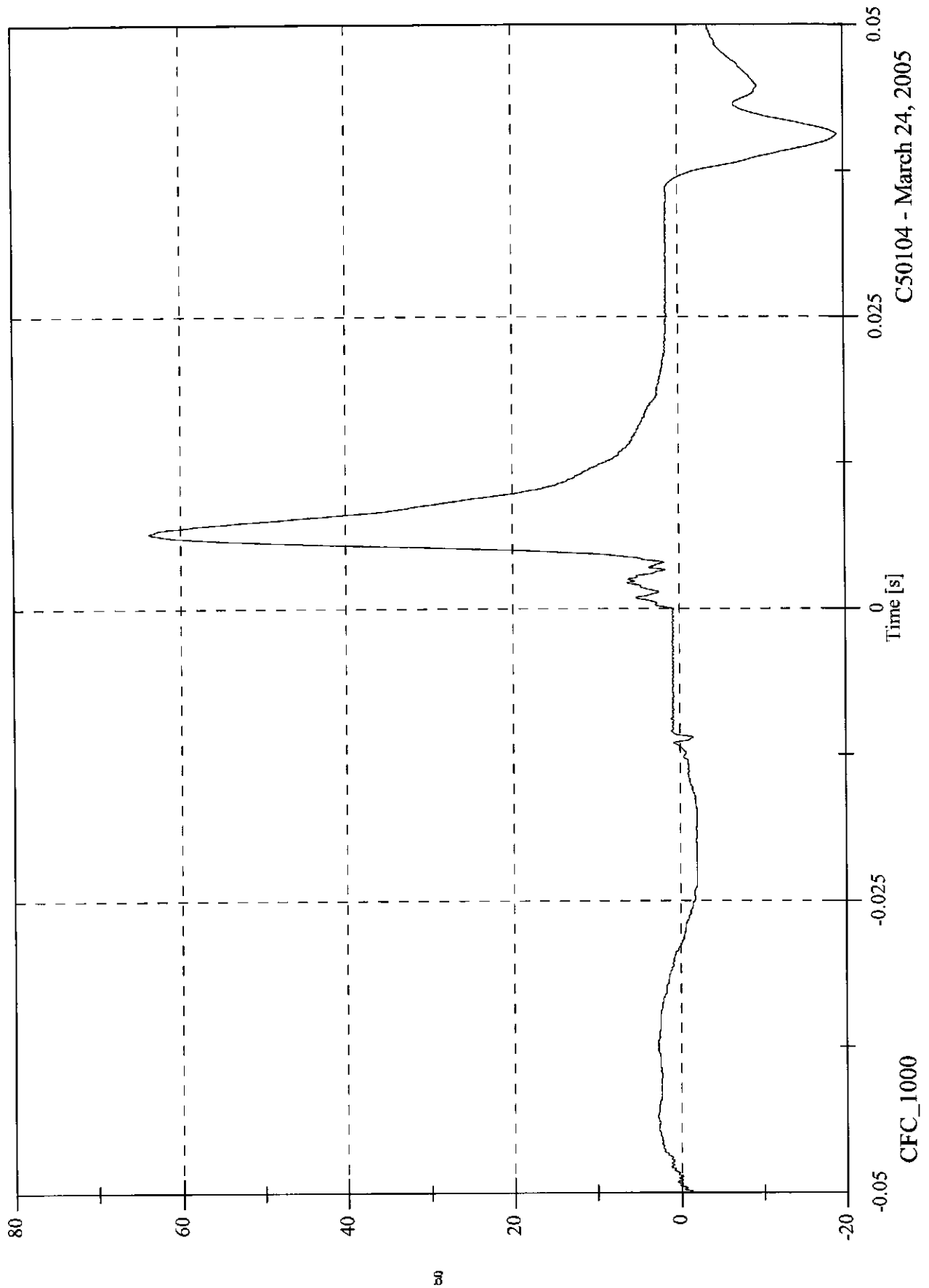
C50104 - March 24, 2005

FMVSS 201U IMPACT TEST - 2005 Buick Lacrosse

Headform Z Acceleration

Max: 63.8 [g] at 0.006 [s]

Min: -19.2 [g] at 0.041 [s]

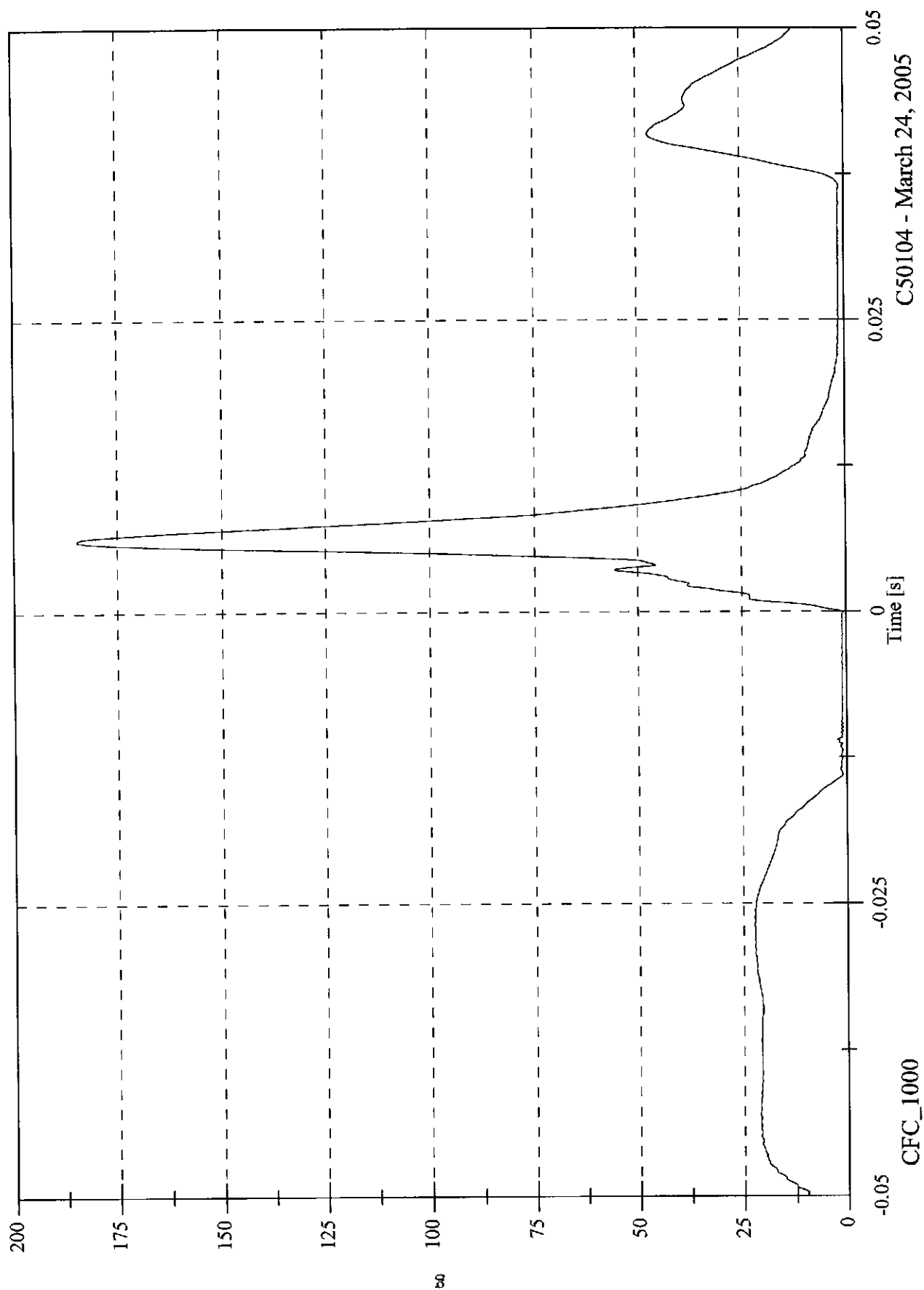


C50104 - March 24, 2005

Max: 184.7 [g] at 0.006 [s]
Min: 0.8 [g] at -0.000 [s]

FMVSS 201U IMPACT TEST - 2005 Buick Lacrosse

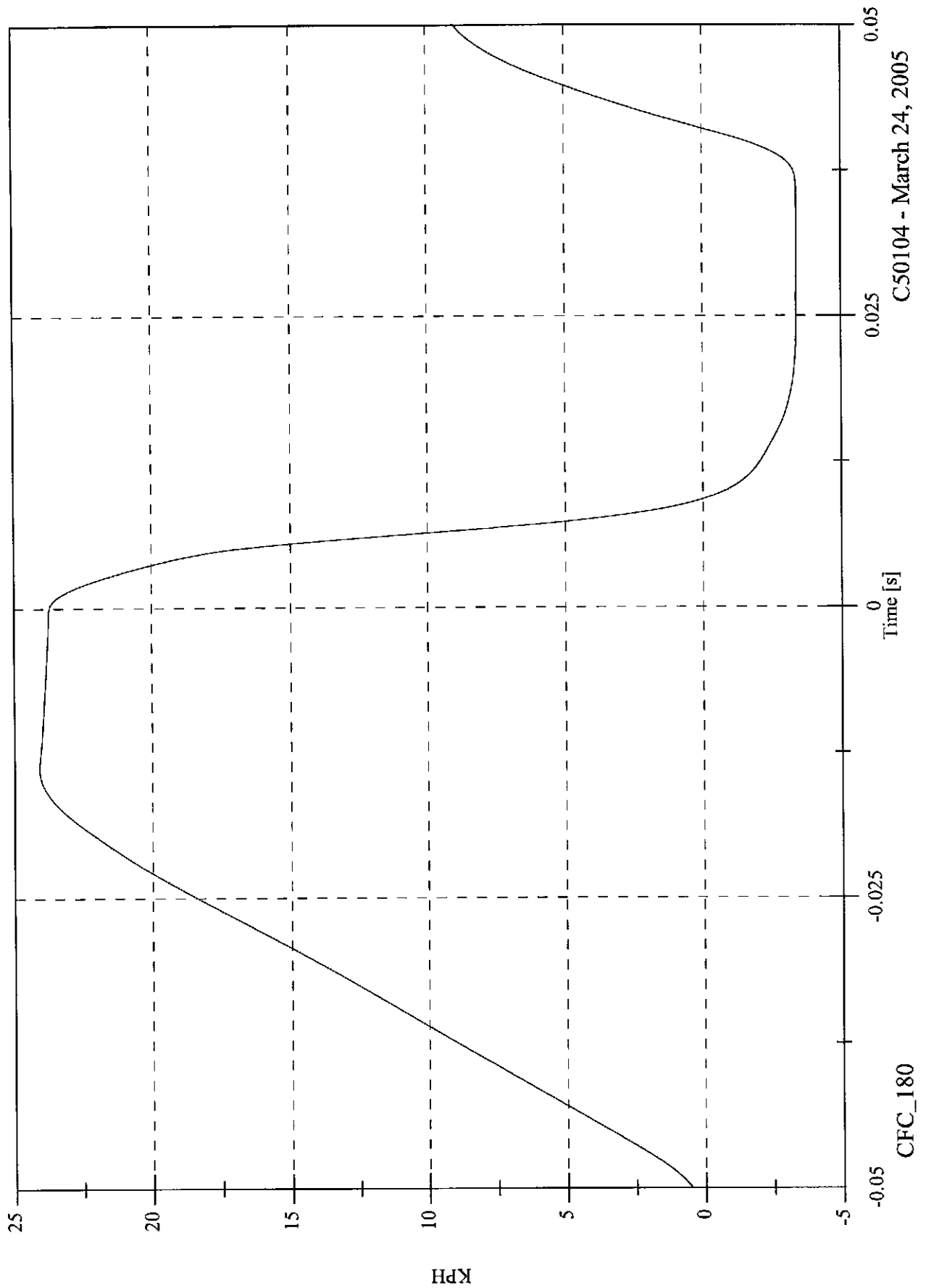
Headform Resultant



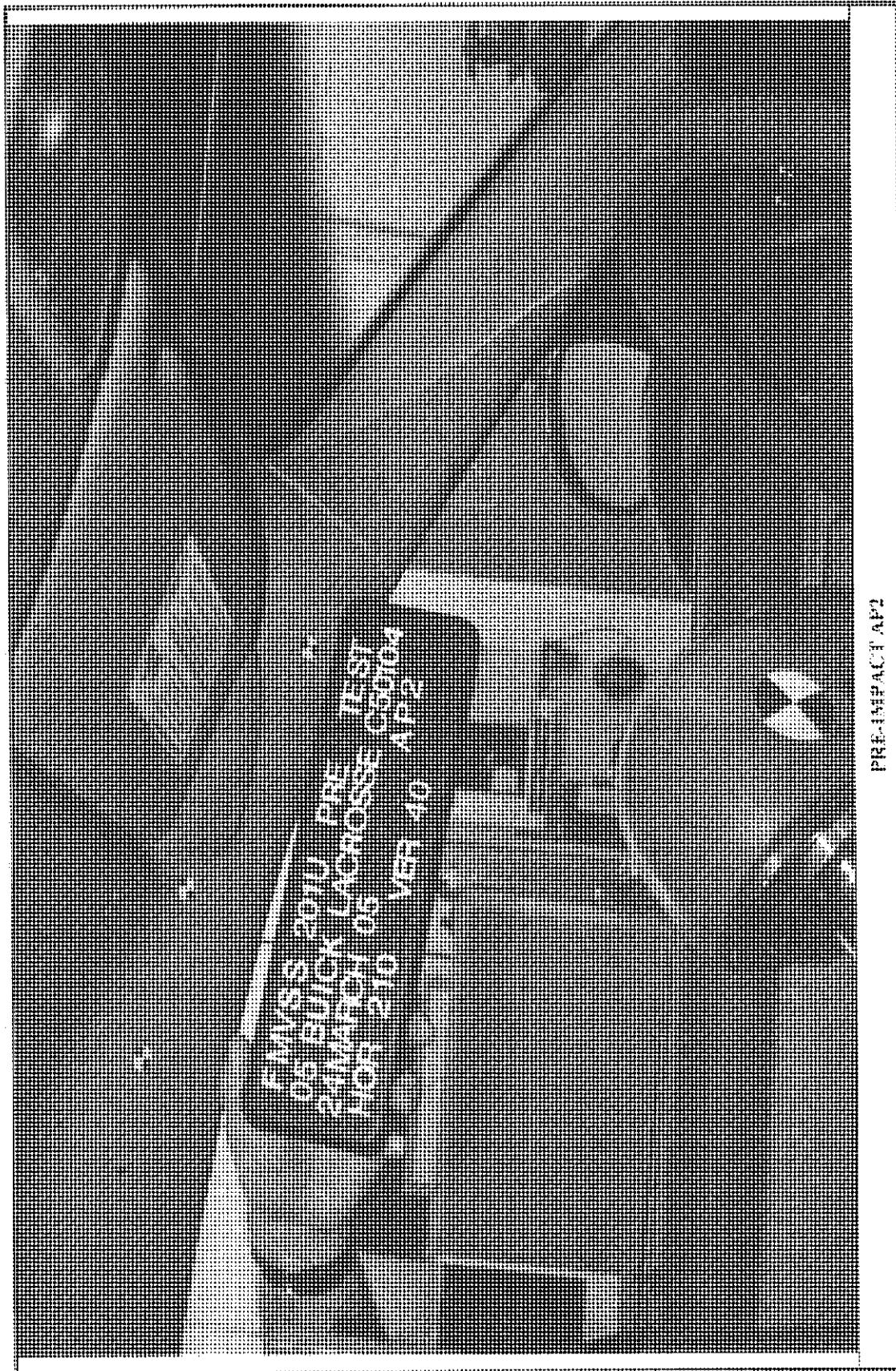
C50104 - March 24, 2005

FMVSS 201U IMPACT TEST - 2005 Buick Lacrosse
Max: 24.1 [KPH] at -0.014 [s]
Min: -3.4 [KPH] at 0.034 [s]

Headform Velocity

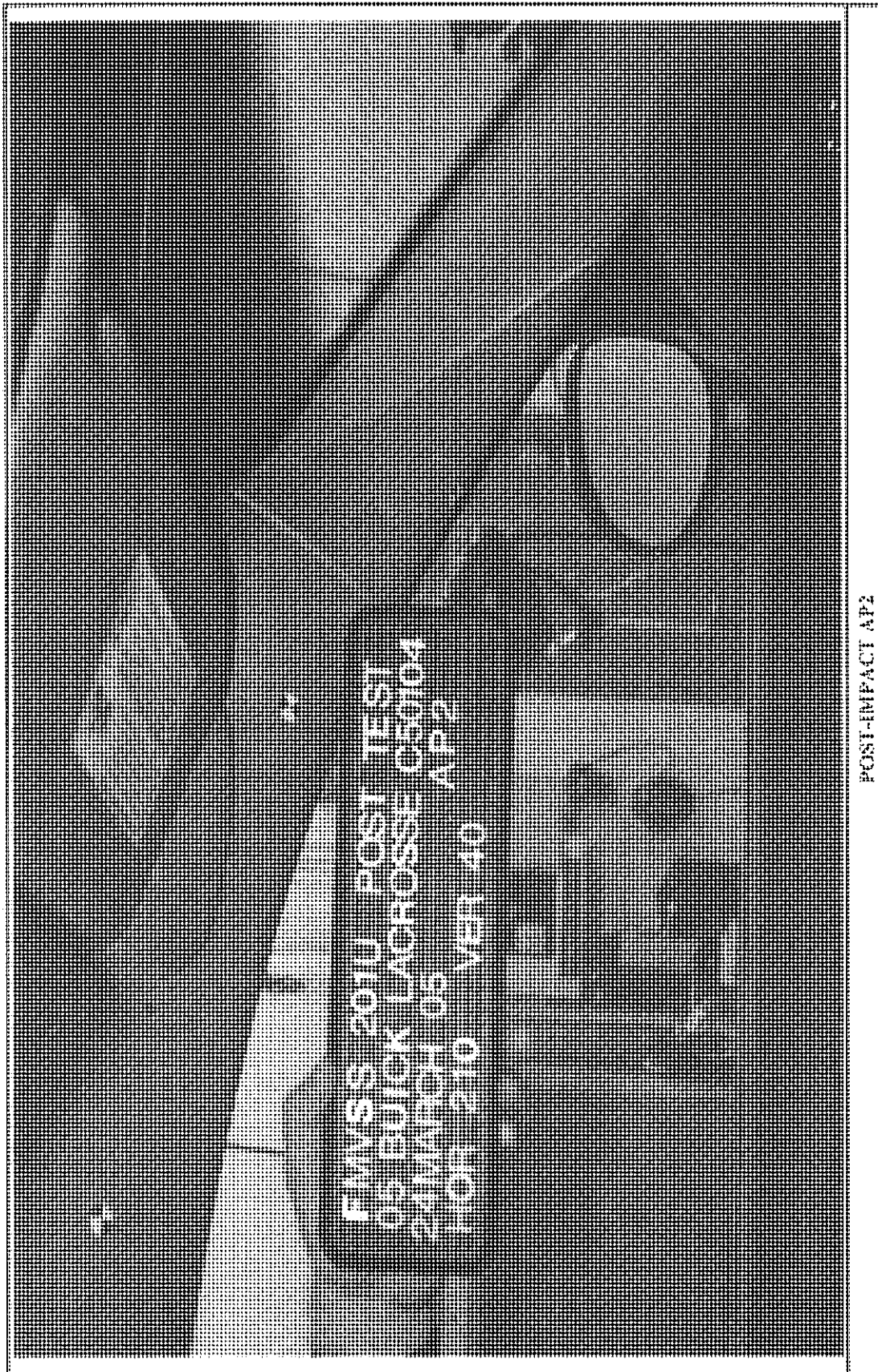


C50104 - March 24, 2005



PRE-IMPACT AP2

8754-FME-04

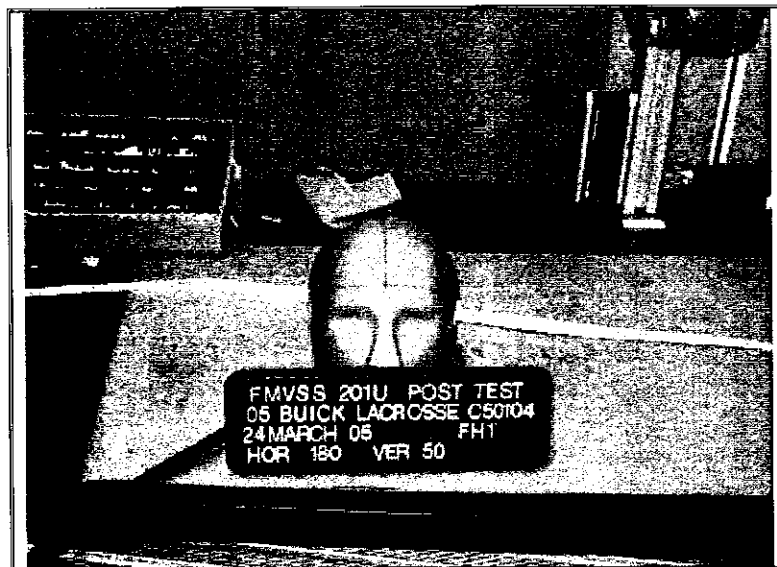


POST-IMPACT AP2

VEHICLE YEAR/MAKE/MODEL/STYLE:	2005 Buick LaCrosse 4-Door Sedan
VIN:	2G4WC532451200267
DATE OF MANUFACTURE:	10/04(SEE CERTIFICATION LABEL)
COLOR:	Red

Test Number:	11
Test Date:	03/24/05
Target Location:	Front Header
Target Code:	FH1
Horizontal Impact Angle:	180°
Vertical Impact Angle:	50°
Ambient Temperature:	24.6C°
Relative Humidity:	19.5
Time of Impact:	9:45
Headform Number:	642

Impact Point Description (from lower midpoint on midsagittal line)				
On Centerline	14	<input checked="" type="checkbox"/>	mm right	<input type="checkbox"/> mm left
On Centerline	24		mm up	



POST-IMPACT FHI HEADFORM

Free Motion HIC	570.7
HIC(d)	597.0
Impact Velocity (kph)	23.74
HIC T1 (msec)	2.8
HIC T2 (msec)	6.6

FMVSS 201U IMPACT TEST - 2005 Buick Lacrosse C50104 - FH1

FMH Headform 0642

Location: FH1

Test Date: March 24, 2005

Work File: FH1

-----TEST RESULTS-----

Lab Temperature: 24.6 C

HICd: 597.0

Lab Humidity: 19.5 %

HIC (36ms): 570.7

Velocity at Impact: 23.74 KPH

t1: 2.8 msec

t2: 6.6 msec

Free Flight Distance: 200.28 mm

Duration: 3.8 msec

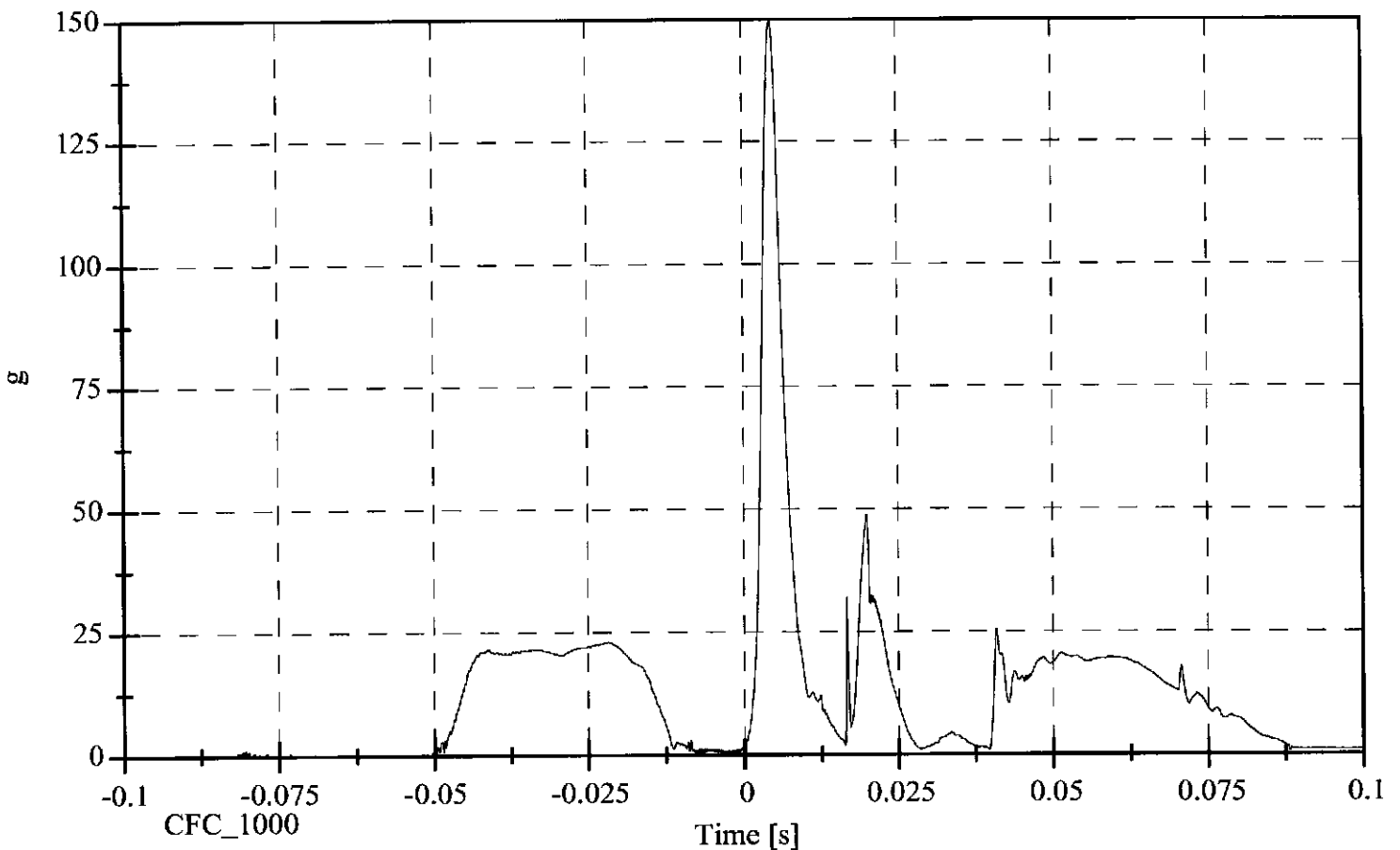
Maximum: 149.8 g

Average Acceleration: 11.5 g

FMVSS 201U IMPACT TEST - 2005 Buick Lacrosse
Headform Resultant

Max: 149.8 [g] at 0.004 [s]

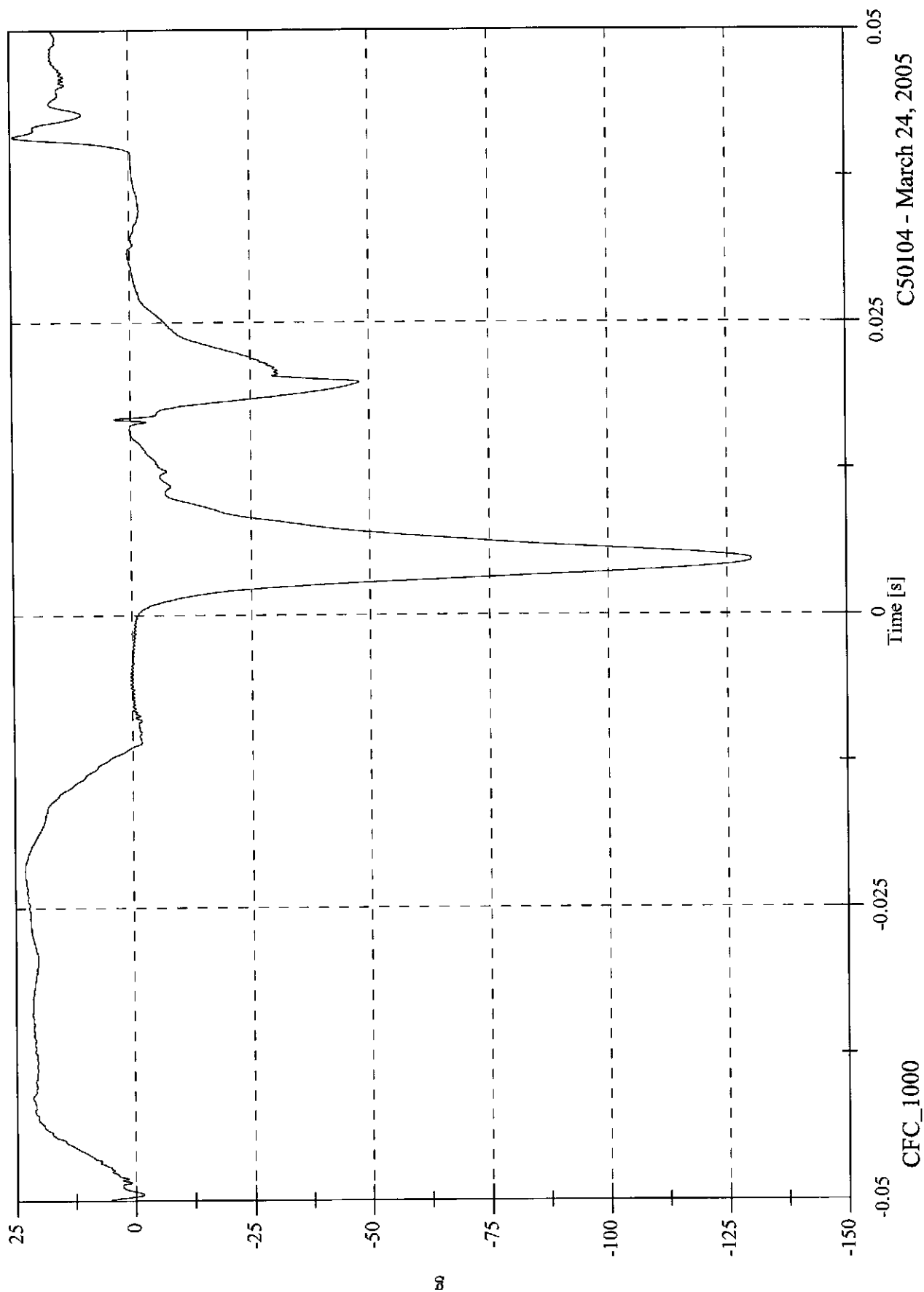
Min: 0.0 [g] at -0.082 [s]



FMVSS 201U IMPACT TEST - 2005 Buick Lacrosse
Headform X Acceleration

Max: 24.5 [g] at 0.041 [s]

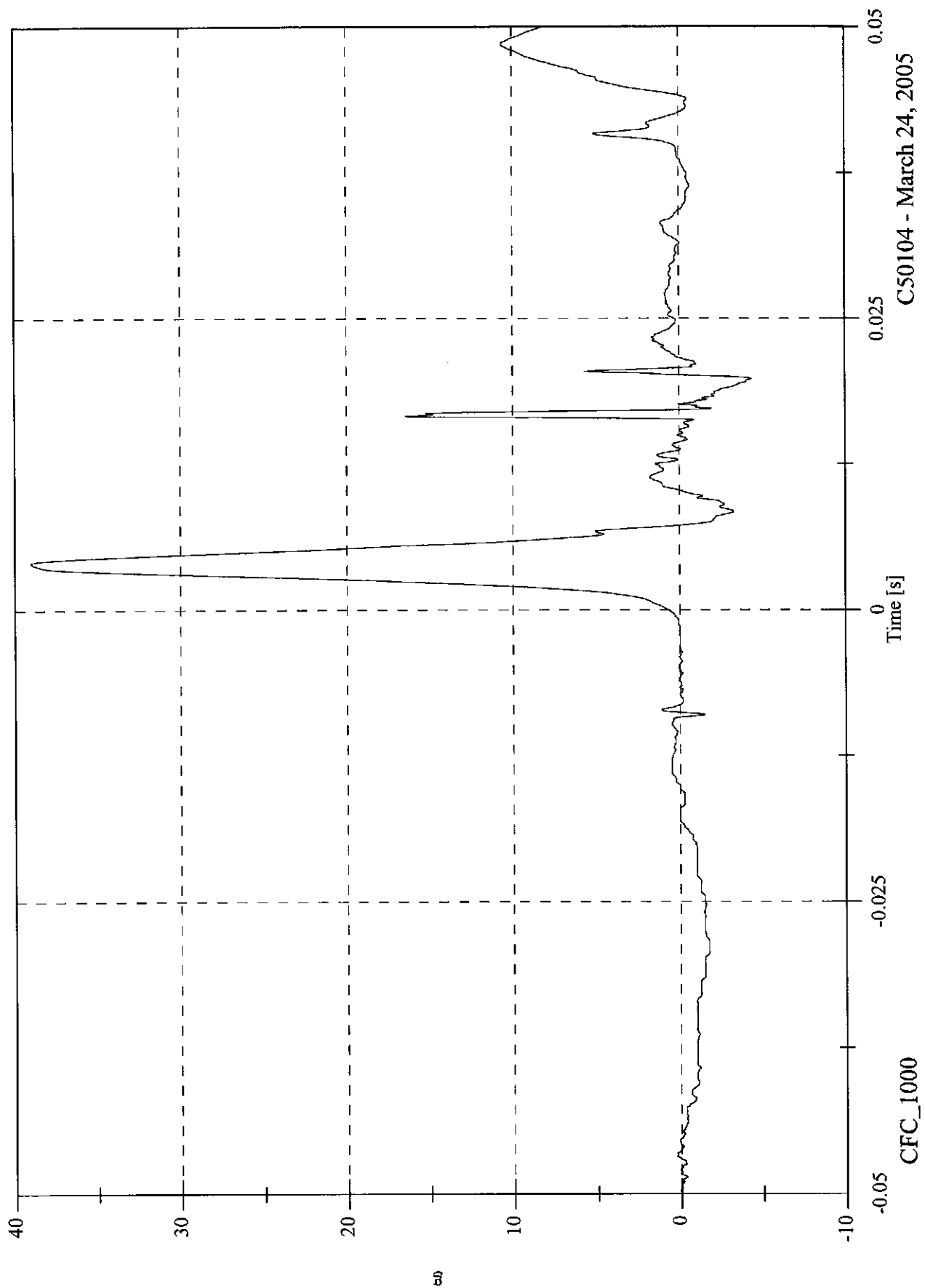
Min: -130.2 [g] at 0.005 [s]



Max: 39.0 [g] at 0.004 [s]
Min: -4.4 [g] at 0.020 [s]

Headform Y Acceleration

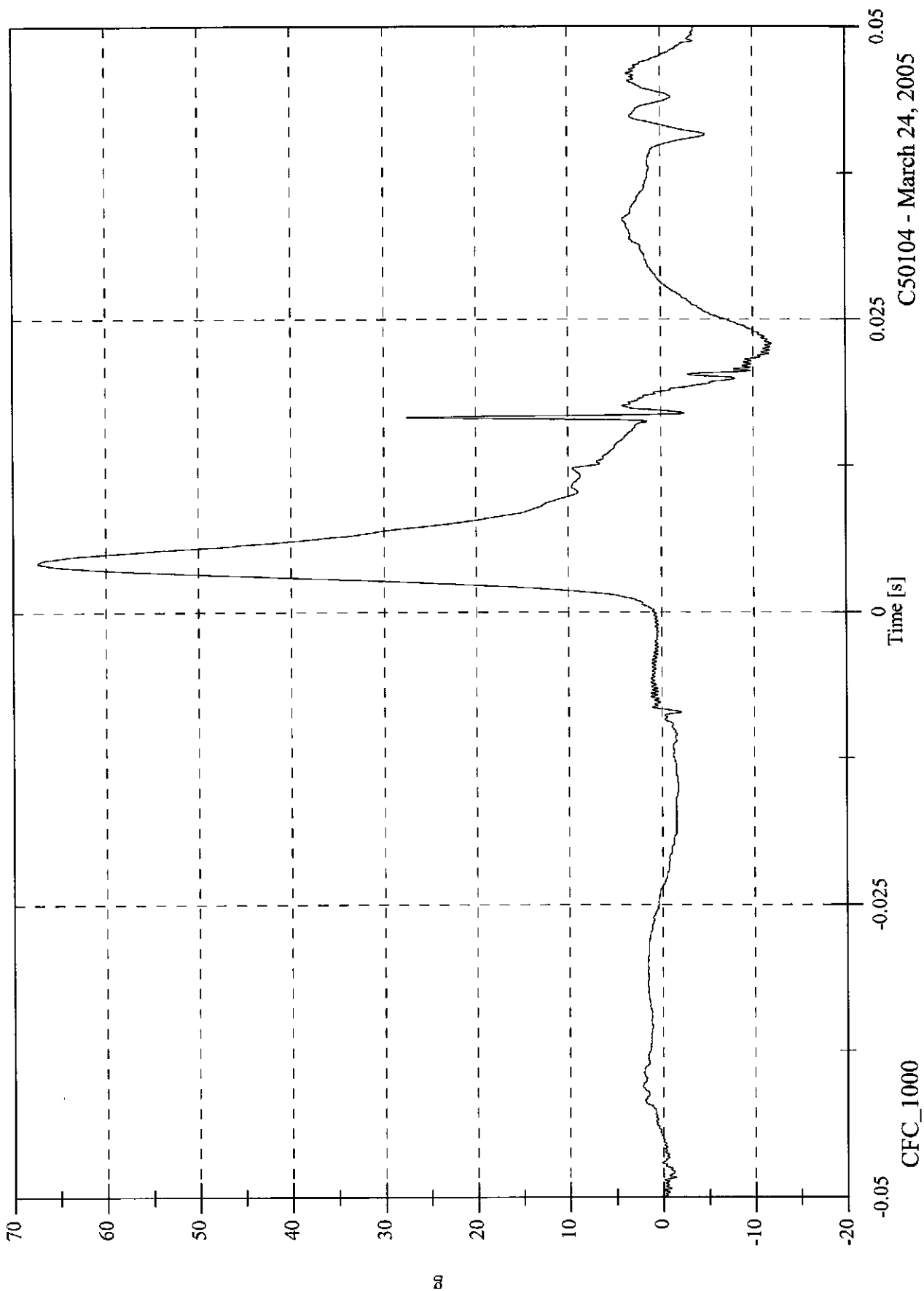
FMVSS 201U IMPACT TEST - 2005 Buick Lacrosse



C50104 - March 24, 2005

FMVSS 201U IMPACT TEST - 2005 Buick Lacrosse
Headform Z Acceleration

Max: 67.4 [g] at 0.004 [s]
Min: -12.0 [g] at 0.023 [s]



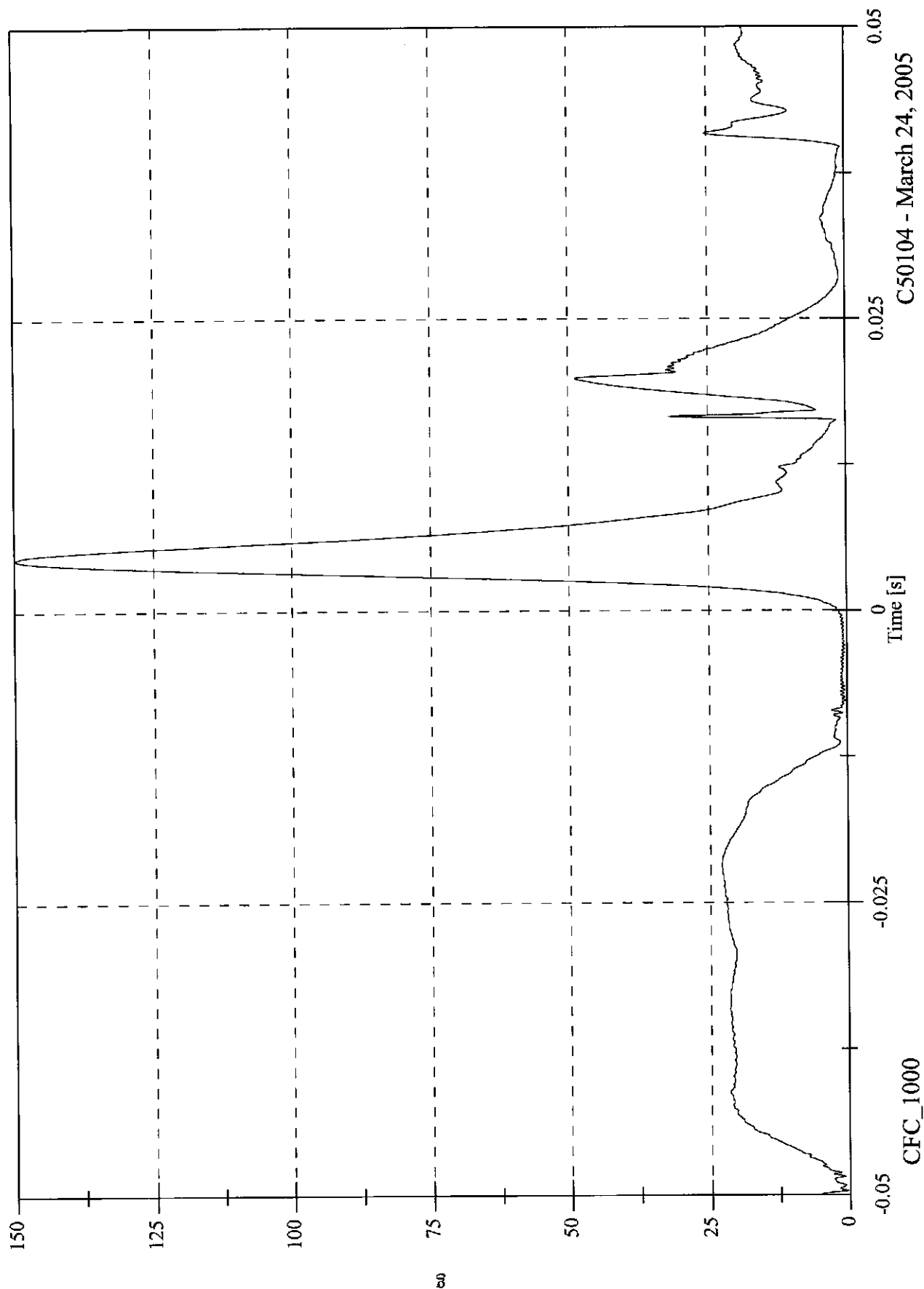
C50104 - March 24, 2005

FMVSS 201U IMPACT TEST - 2005 Buick Lacrosse

Headform Resultant

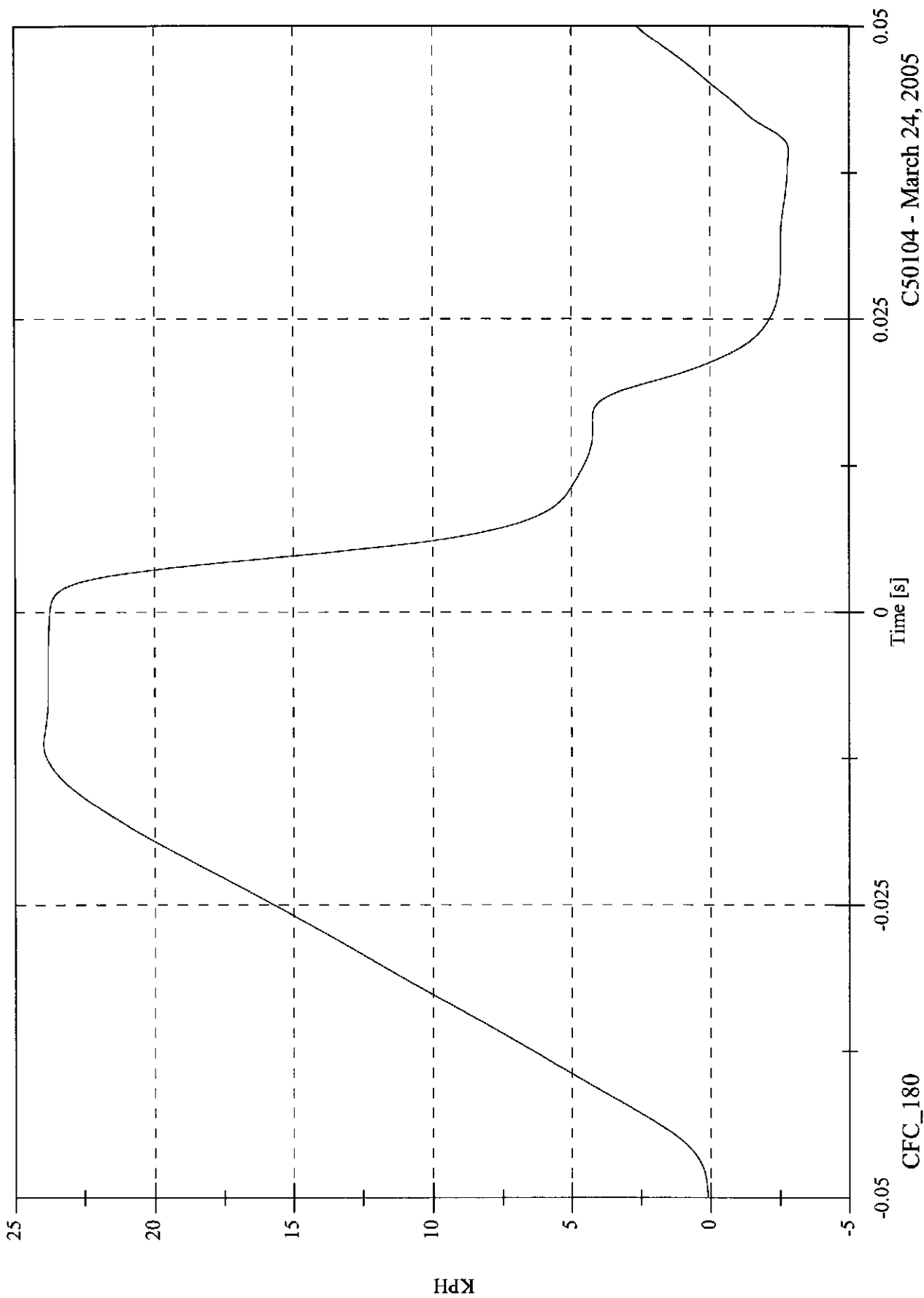
Max: 149.8 [g] at 0.004 [s]

Min: 0.3 [g] at -0.008 [s]



FMVSS 201U IMPACT TEST - 2005 Buick Lacrosse
Headform Velocity

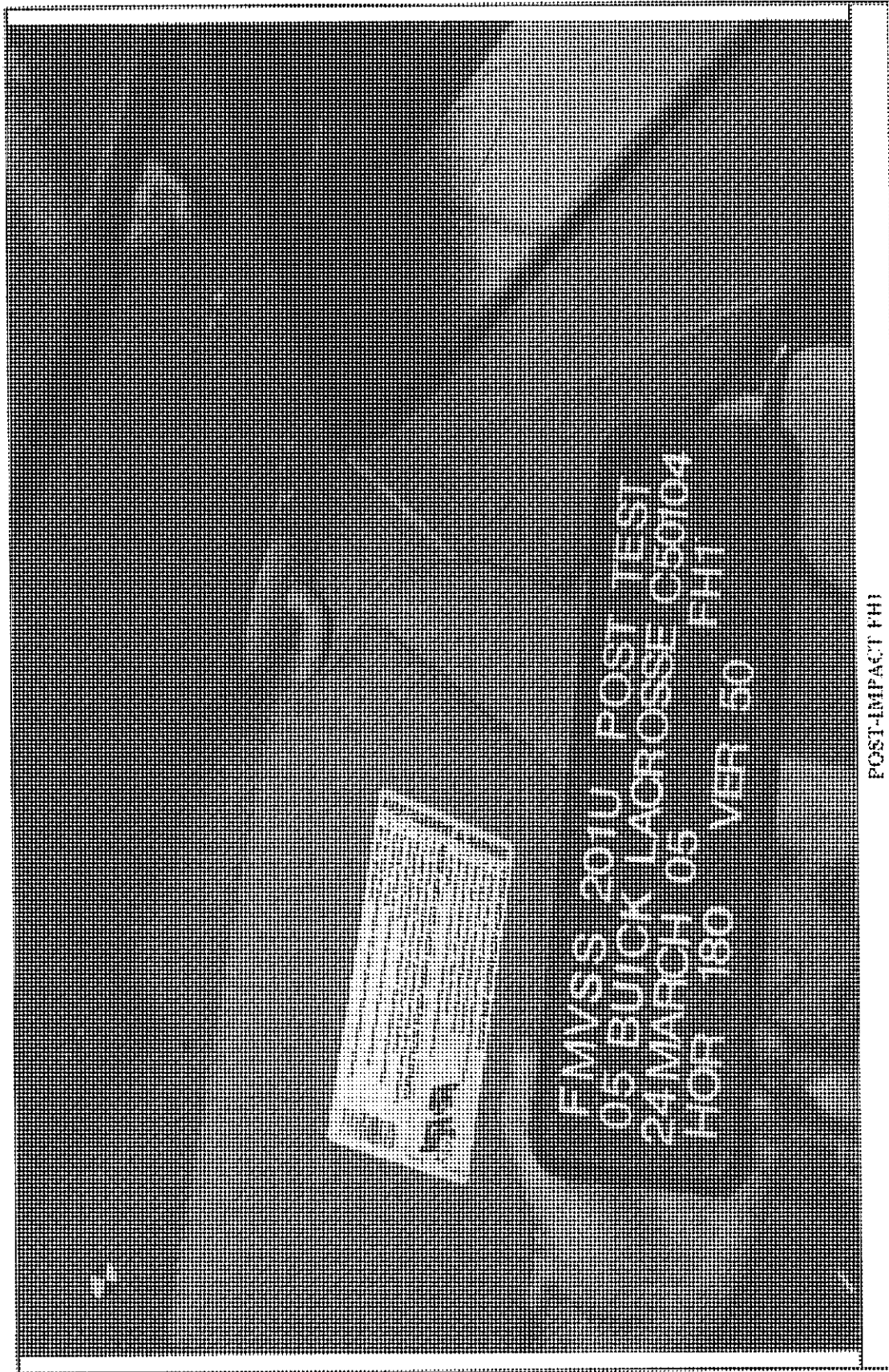
Max: 24.0 [KPH] at -0.011 [s]
Min: -2.8 [KPH] at 0.039 [s]



FMV9 S 201U PRE TEST
05 BUICK LACROSSE 050104
24 MARCH 05
HOF 180 VER 50 FHJ

PRE-IMPACT PH

8754-FMH-04



FMVSS 201U POST TEST
05 BUICK LACROSSE C50104
24 MARCH 05 FHI
HCH 180 VER 50

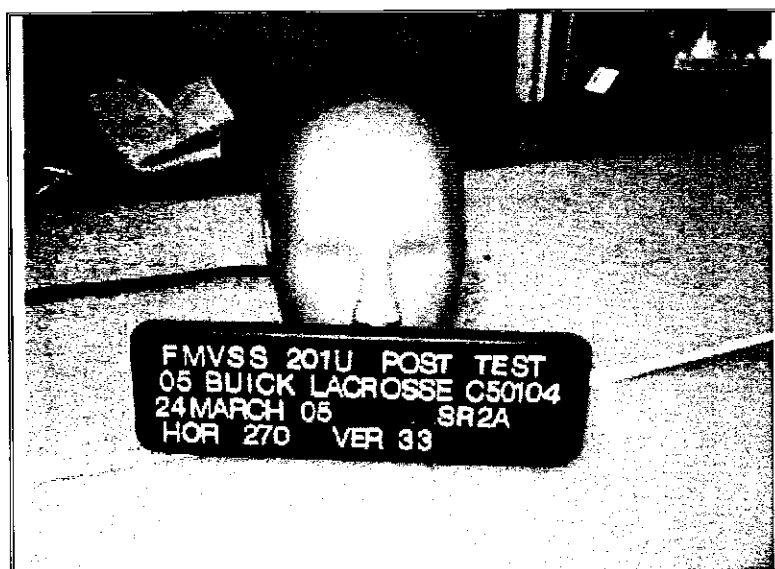
POST-IMPACT FHI

8754-FMH-04

VEHICLE YEAR/MAKE/MODEL/STYLE:	2005 Buick LaCrosse 4-Door Sedan
VIN:	2G4WC532451200267
DATE OF MANUFACTURE:	10/04(SEE CERTIFICATION LABEL)
COLOR:	Red

Test Number:	12
Test Date:	03/24/05
Target Location:	Side Rail
Target Code:	SR2A
Horizontal Impact Angle:	270°
Vertical Impact Angle:	33°
Ambient Temperature:	24.6C°
Relative Humidity:	20.1
Time of Impact:	10:30
Headform Number:	805

Impact Point Description (from lower midpoint on midsagittal line)			
On Centerline	5	<input type="checkbox"/> mm right	<input checked="" type="checkbox"/> mm left
On Centerline	15	mm up	



POST-IMPACT SR2A HEADFORM

Free Motion HIC	820.3
HIC(d)	785.3
Impact Velocity (kph)	23.48
HIC T1 (msec)	2.0
HIC T2 (msec)	8.2

FMVSS 201U IMPACT TEST - 2005 Buick Lacrosse C50104 - SR2A

FMH Headform 805

Location: SR2A

Test Date: March 24, 2005

Work File: SR2A

-----TEST RESULTS-----

Lab Temperature: 24.6 C

HICd: 785.3

Lab Humidity: 20.1 %

HIC (36ms): 820.3

Velocity at Impact: 23.48 KPH

t1: 2.0 msec

t2: 8.2 msec

Free Flight Distance: 213.23 mm

Duration: 6.2 msec

Maximum: 166.9 g

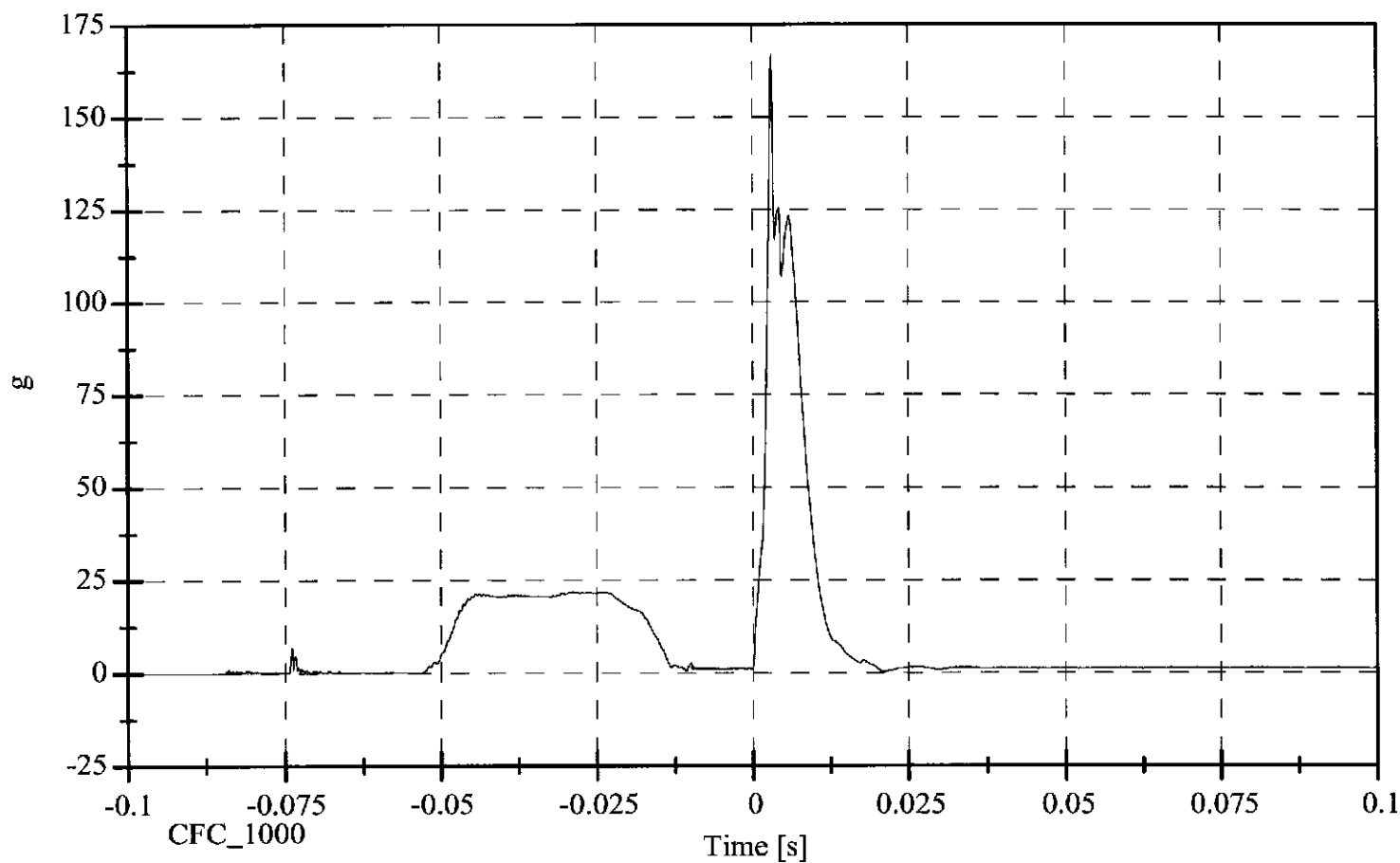
Average Acceleration: 8.6 g

FMVSS 201U IMPACT TEST - 2005 Buick Lacrosse

Max: 166.9 [g] at 0.003 [s]

Headform Resultant

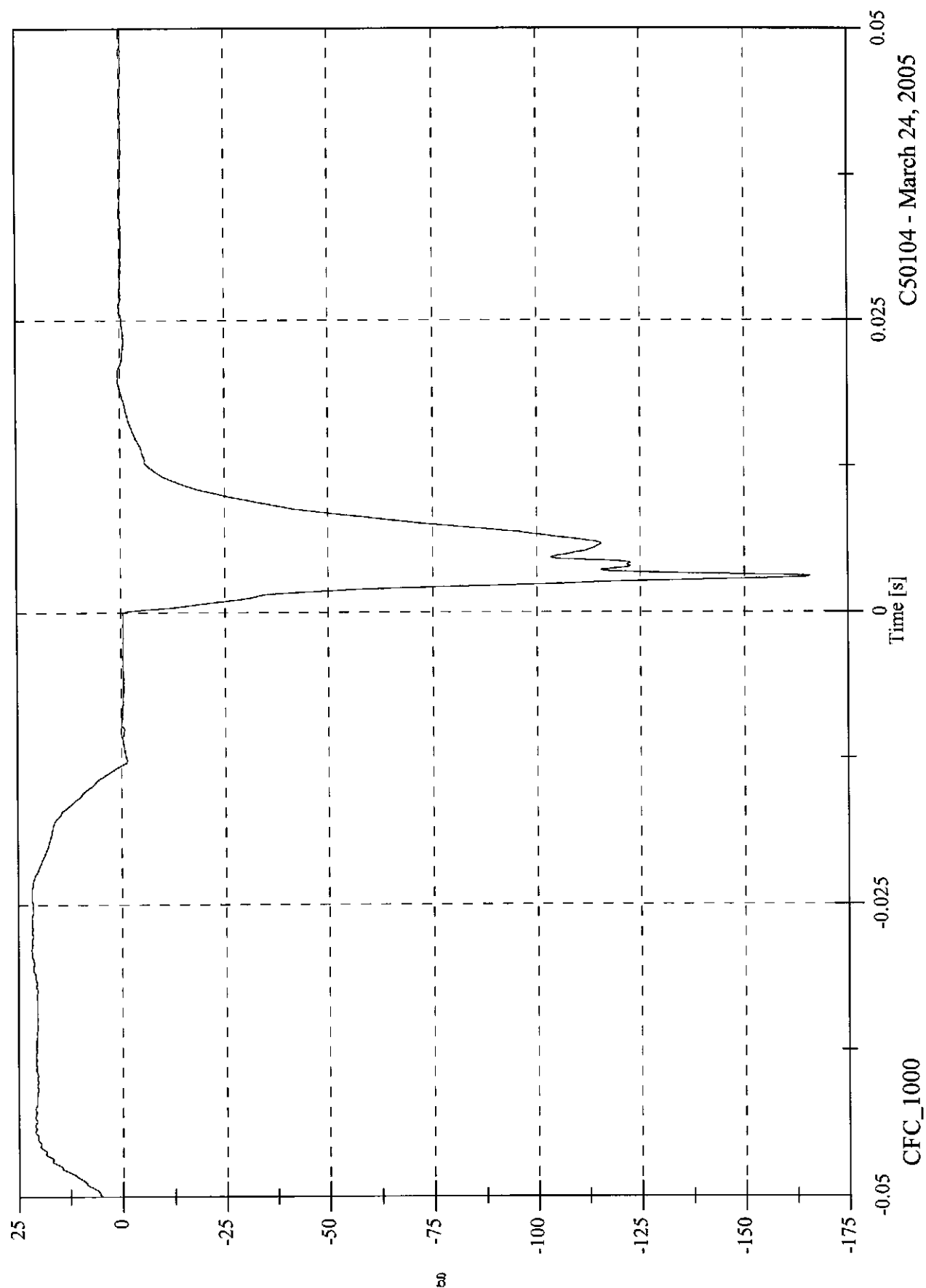
Min: -0.0 [g] at -0.100 [s]



Max: 21.8 [g] at -0.029 [s]
Min: -165.9 [g] at 0.003 [s]

Headform X Acceleration

FMVSS 201U IMPACT TEST - 2005 Buick Lacrosse



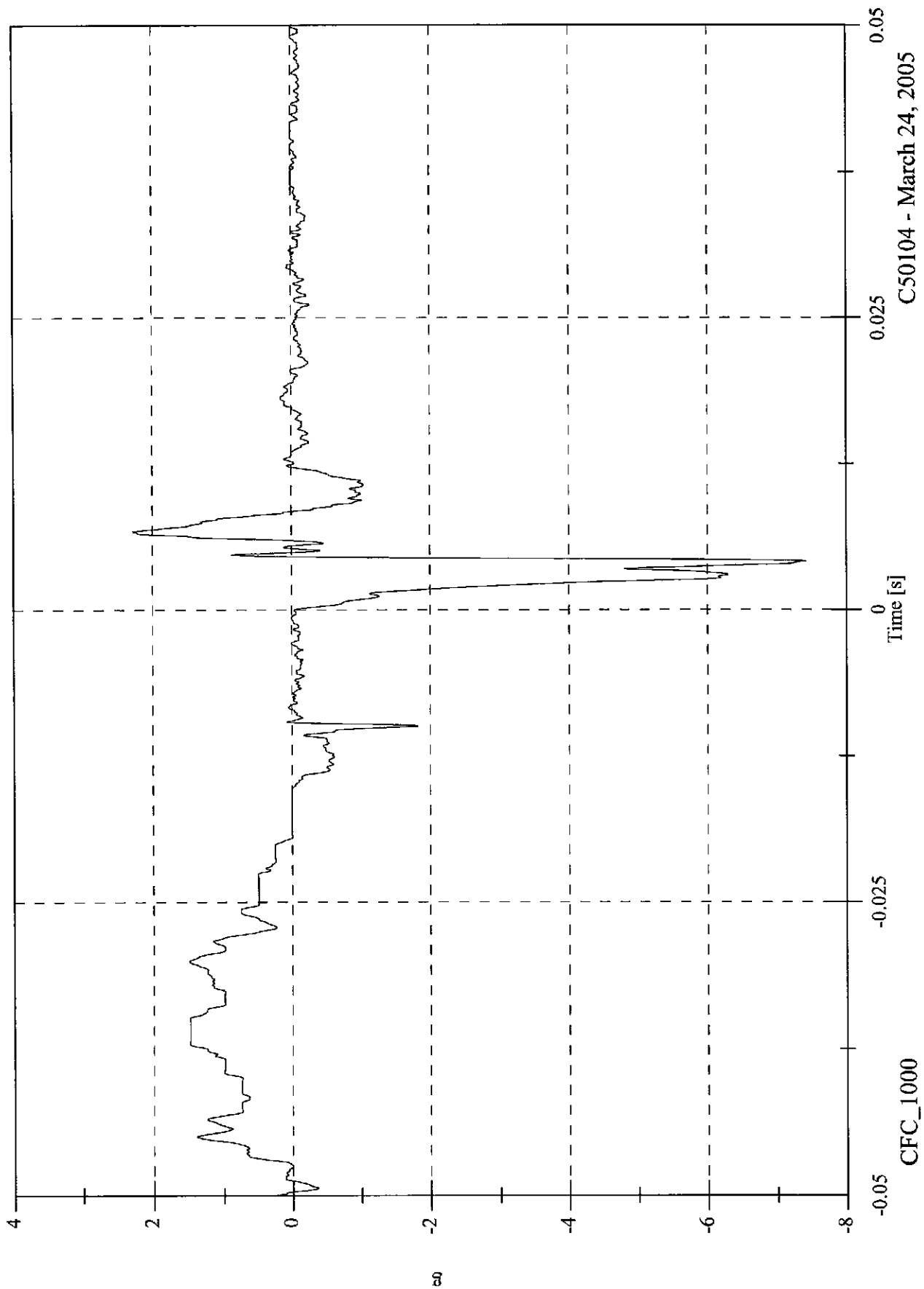
C50104 - March 24, 2005

FMVSS 201U IMPACT TEST - 2005 Buick Lacrosse

Headform Y Acceleration

Max: 2.3 [g] at 0.007 [s]

Min: -7.4 [g] at 0.004 [s]



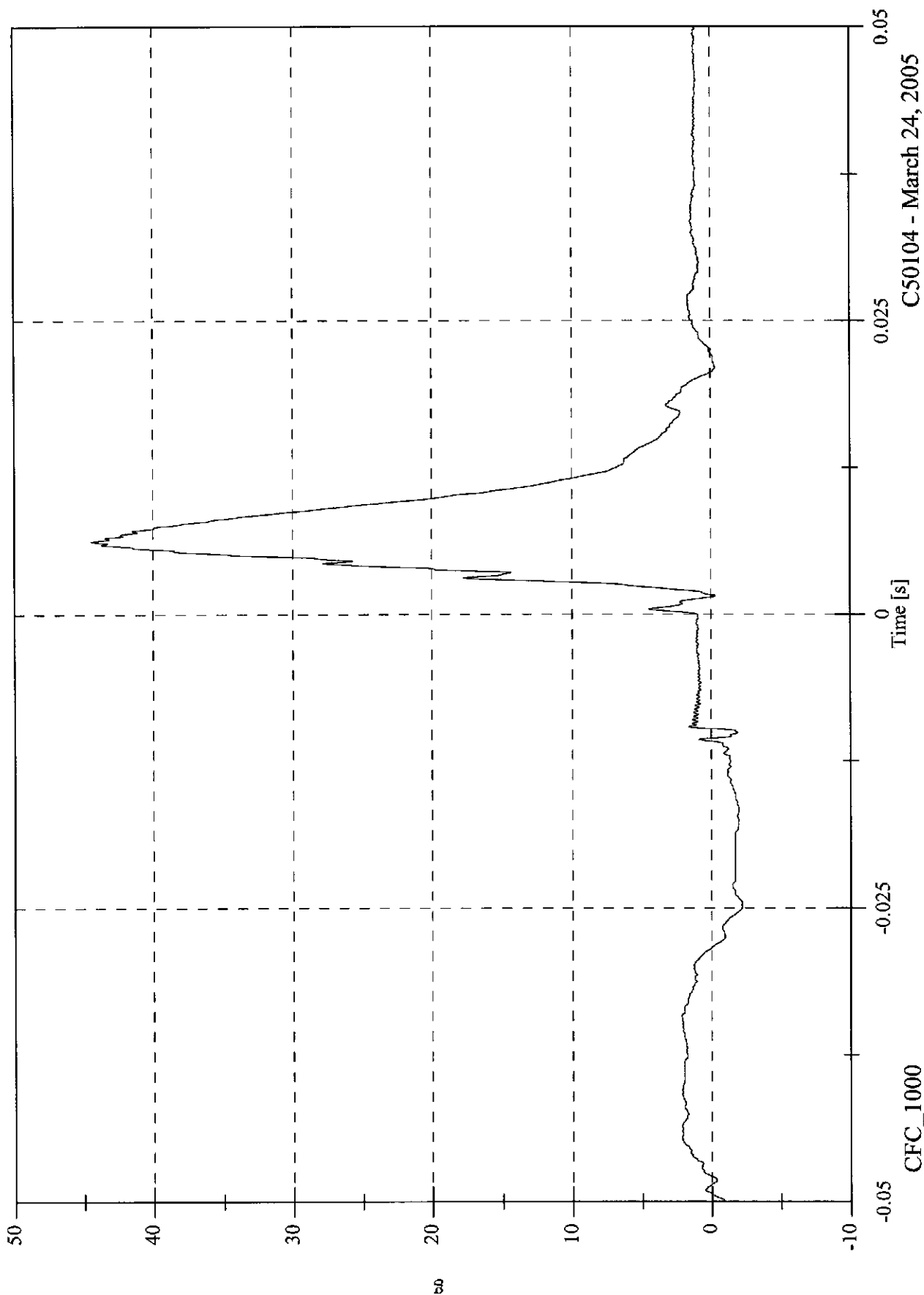
CFC_1000

FMVSS 201U IMPACT TEST - 2005 Buick Lacrosse

Headform Z Acceleration

Max: 44.4 [g] at 0.006 [s]

Min: -2.2 [g] at -0.025 [s]



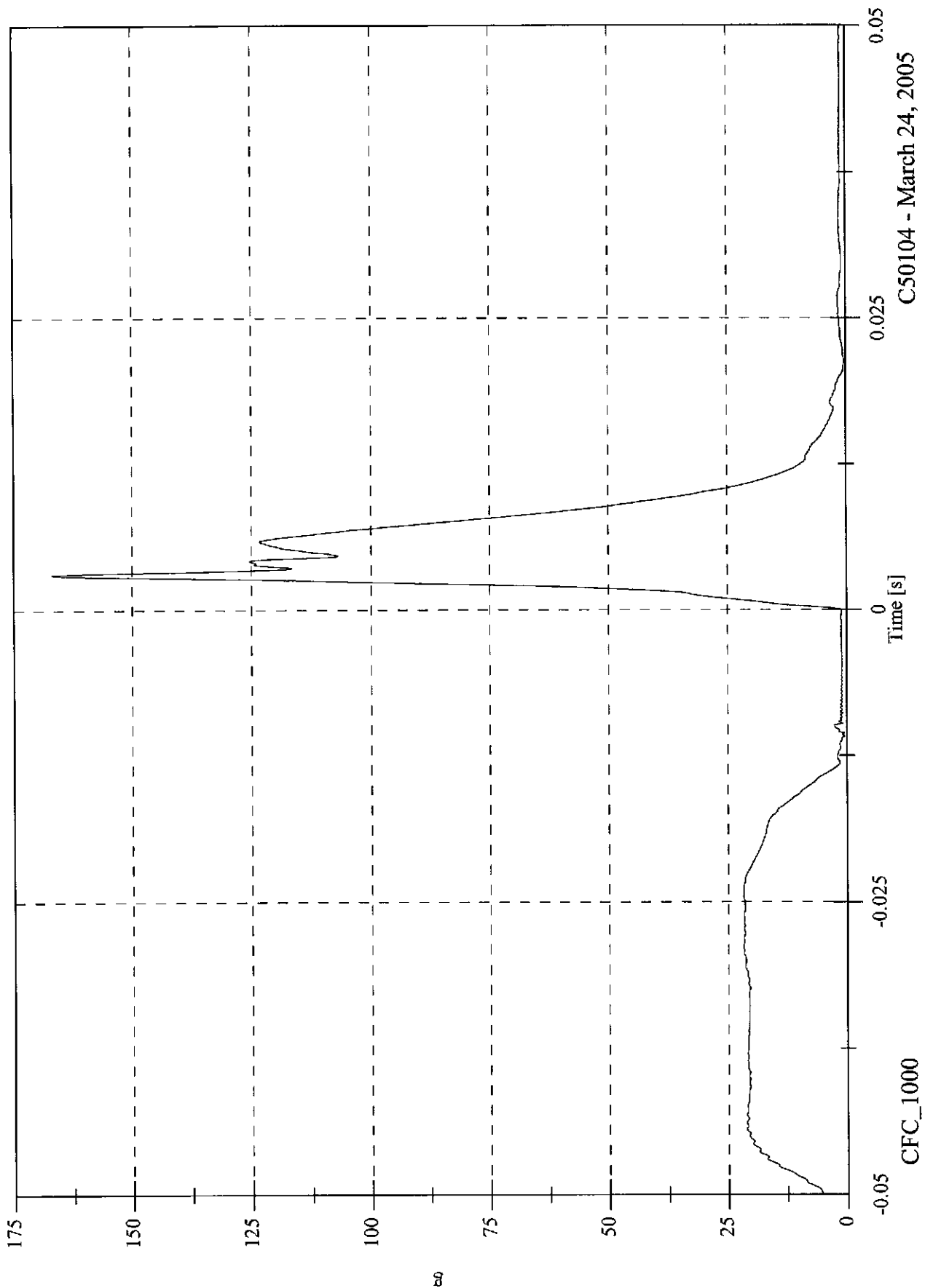
C50104 - March 24, 2005

FMVSS 201U IMPACT TEST - 2005 Buick Lacrosse

Headform Resultant

Max: 166.9 [g] at 0.003 [s]

Min: 0.4 [g] at 0.021 [s]

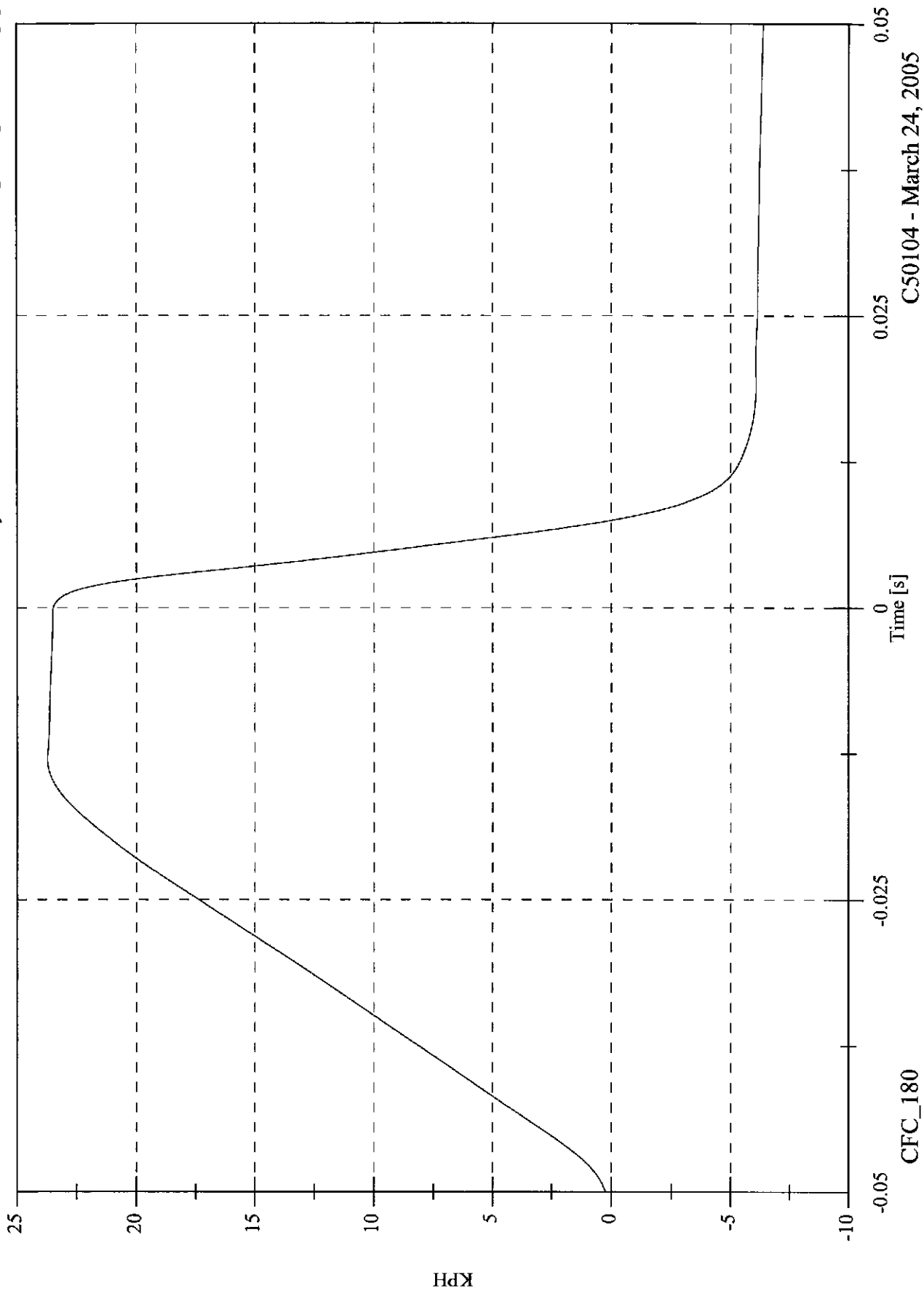


C50104 - March 24, 2005

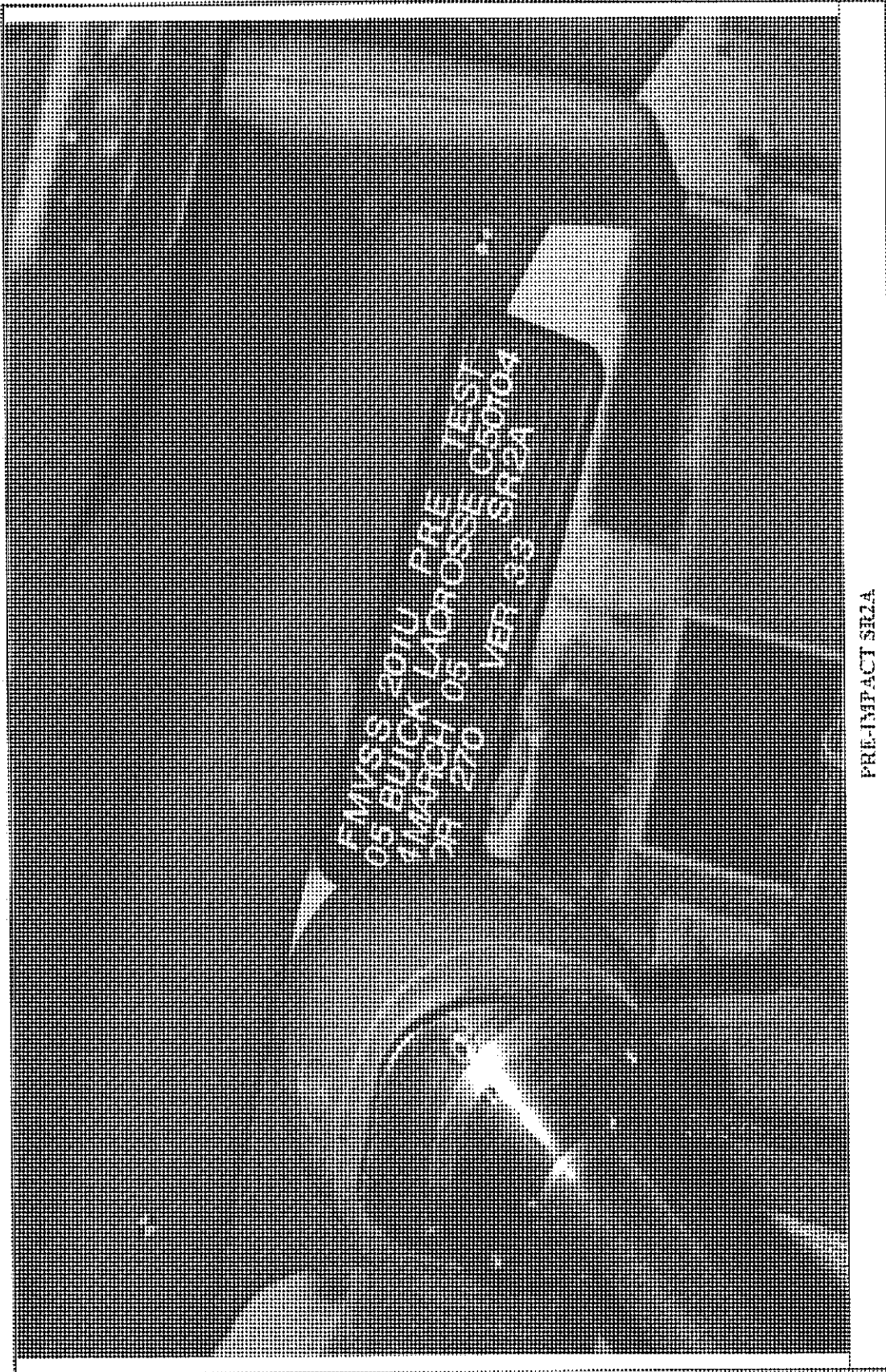
Max: 23.7 [KPH] at -0.013 [s]
Min: -6.4 [KPH] at 0.050 [s]

FMVSS 201U IMPACT TEST - 2005 Buick Lacrosse

Headform Velocity

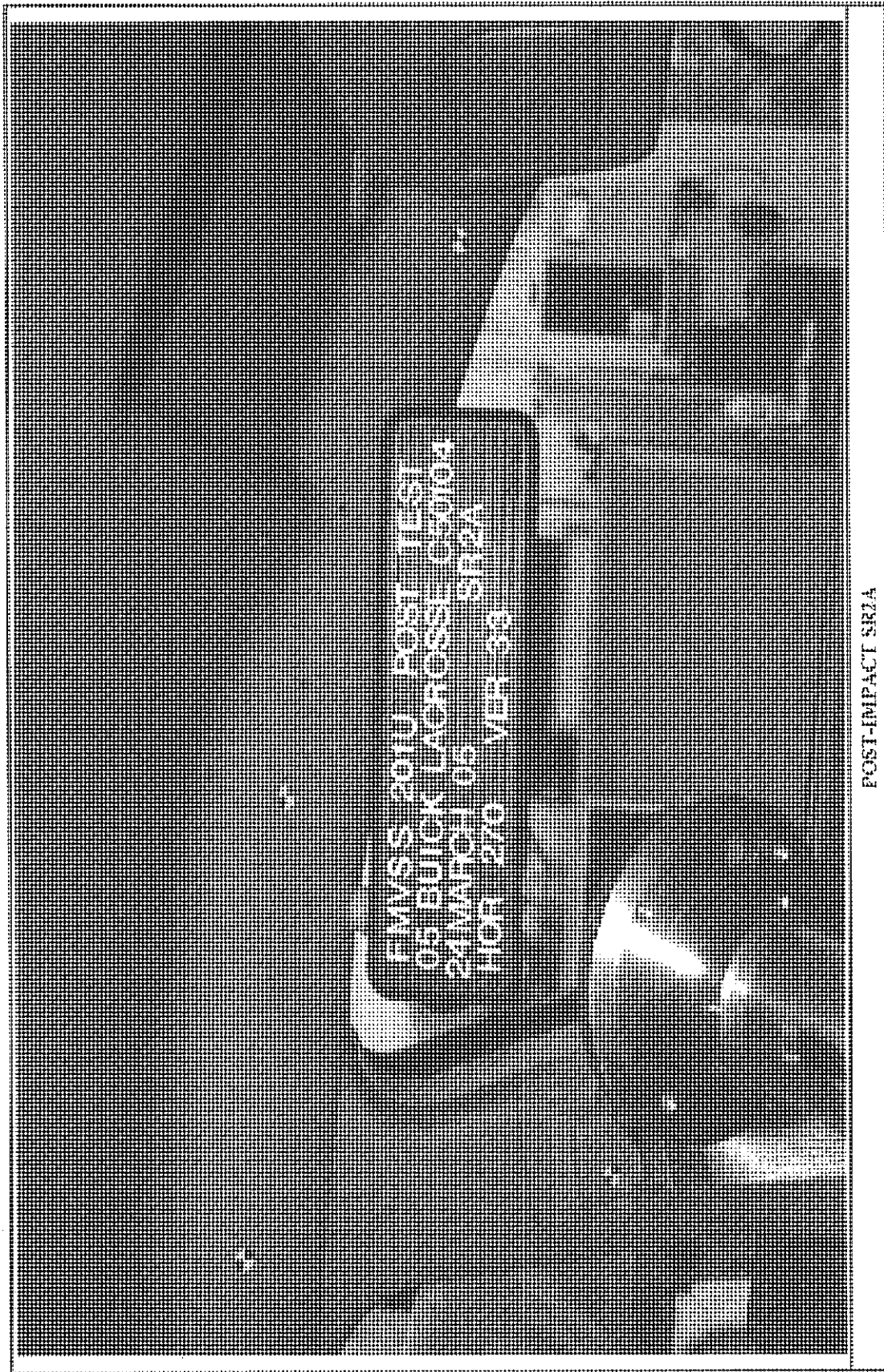


CFC_180



PRE-IMPACT SR2A

8784-FME-04



POST-IMPACT SR2A

APPENDIX A

PHOTOGRAPHS

PHOTOGRAPHS

FIGURE	VIEW
A-1	LEFT SIDE VIEW OF VEHICLE
A-2	RIGHT SIDE VIEW OF VEHICLE
A-3	3/4 FRONTAL VIEW FROM LEFT SIDE OF VEHICLE
A-4	3/4 REAR VIEW FROM RIGHT SIDE OF VEHICLE
A-5	VEHICLE'S CERTIFICATION LABEL
A-6	VEHICLE'S TIRE INFORMATION LABEL
A-7	PRE-TEST DRIVER SIDE A-PILLAR
A-8	PRE-TEST DRIVER SIDE FRONT HEADER
A-9	PRE-TEST DRIVER SIDE SIDE RAIL
A-10	PRE-TEST DRIVER SIDE B-PILLAR
A-11	PRE-TEST DRIVER SIDE REAR PILLAR
A-12	PRE-TEST PASSENGER SIDE A-PILLAR
A-13	PRE-TEST PASSENGER SIDE FRONT HEADER
A-14	PRE-TEST PASSENGER SIDE SIDE RAIL
A-15	PRE-TEST PASSENGER SIDE B-PILLAR
A-16	PRE-TEST PASSENGER SIDE REAR PILLAR
A-17	POST-TEST DRIVER SIDE A-PILLAR
A-18	POST-TEST DRIVER FRONT HEADER
A-19	POST-TEST DRIVER SIDE SIDE RAIL
A-20	POST-TEST DRIVER SIDE B-PILLAR
A-21	POST-TEST DRIVER SIDE REAR PILLAR
A-22	POST-TEST PASSENGER SIDE A-PILLAR
A-23	POST-TEST PASSENGER FRONT HEADER
A-24	POST-TEST PASSENGER SIDE SIDE RAIL
A-25	POST-TEST PASSENGER SIDE B-PILLAR
A-26	POST-TEST PASSENGER SIDE REAR PILLAR



FIGURE A-1: LEFT SIDE VIEW OF VEHICLE



Figure A-2: RIGHT SIDE VIEW OF VEHICLE



Figure A-5. 3/4 FRONTAL VIEW FROM LEFT SIDE OF VEHICLE



Figure A-4 : 3/4 REAR VIEW FROM RIGHT SIDE OF VEHICLE

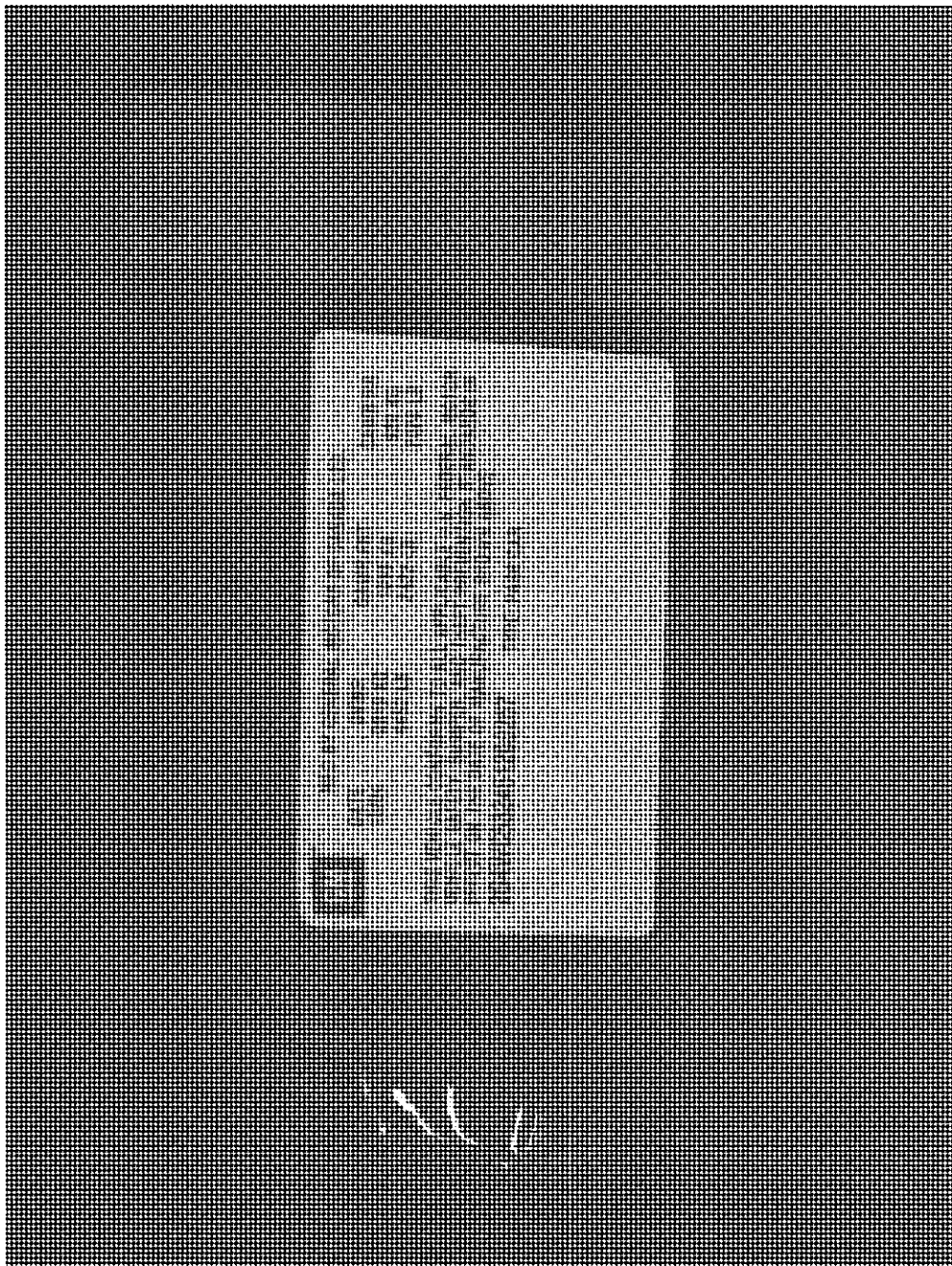


Figure A-5 : VEHICLE'S CERTIFICATION LABEL

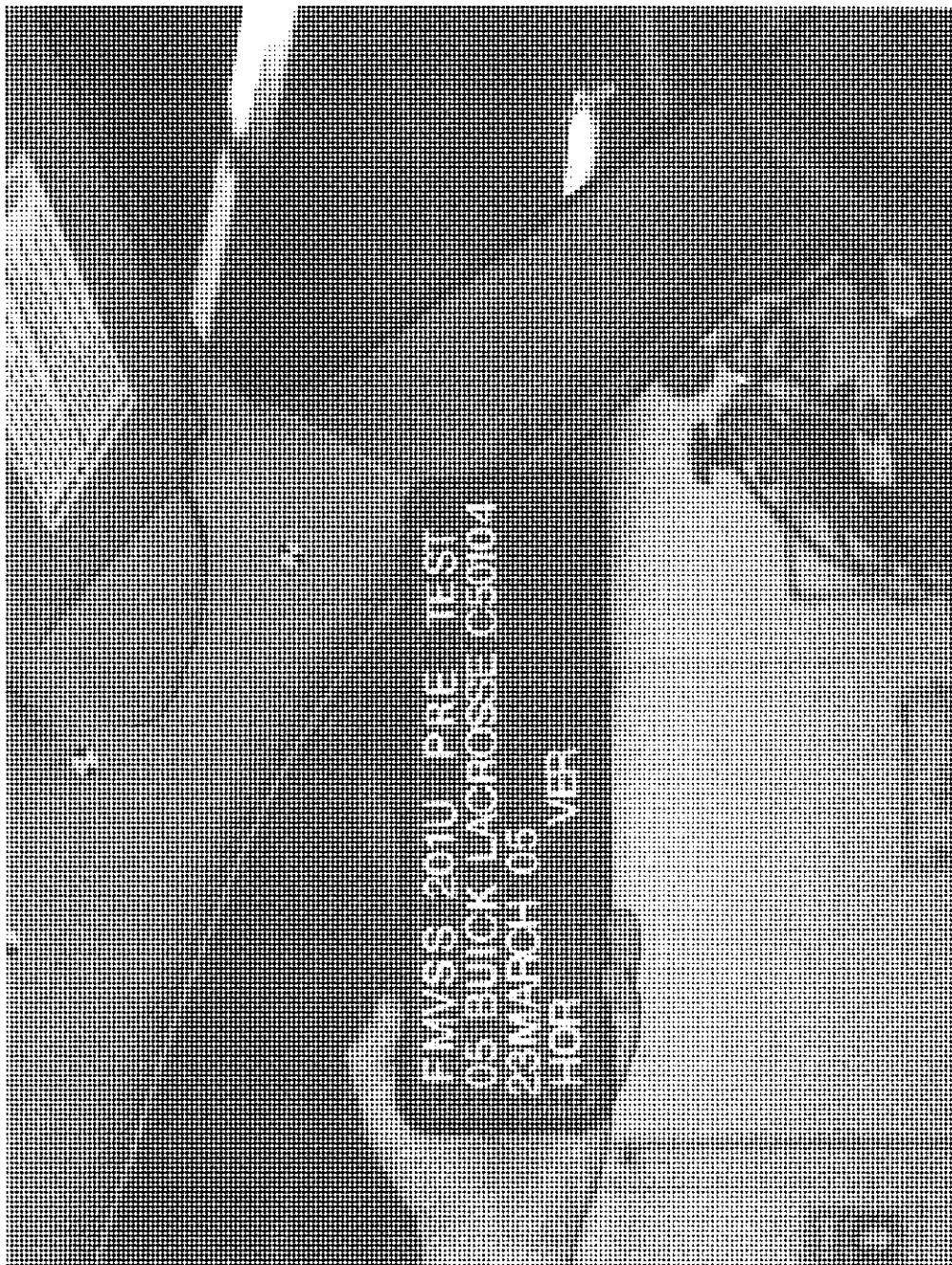


Figure A-7 - PRE-TEST DRIVER SIDE A-PILLAR

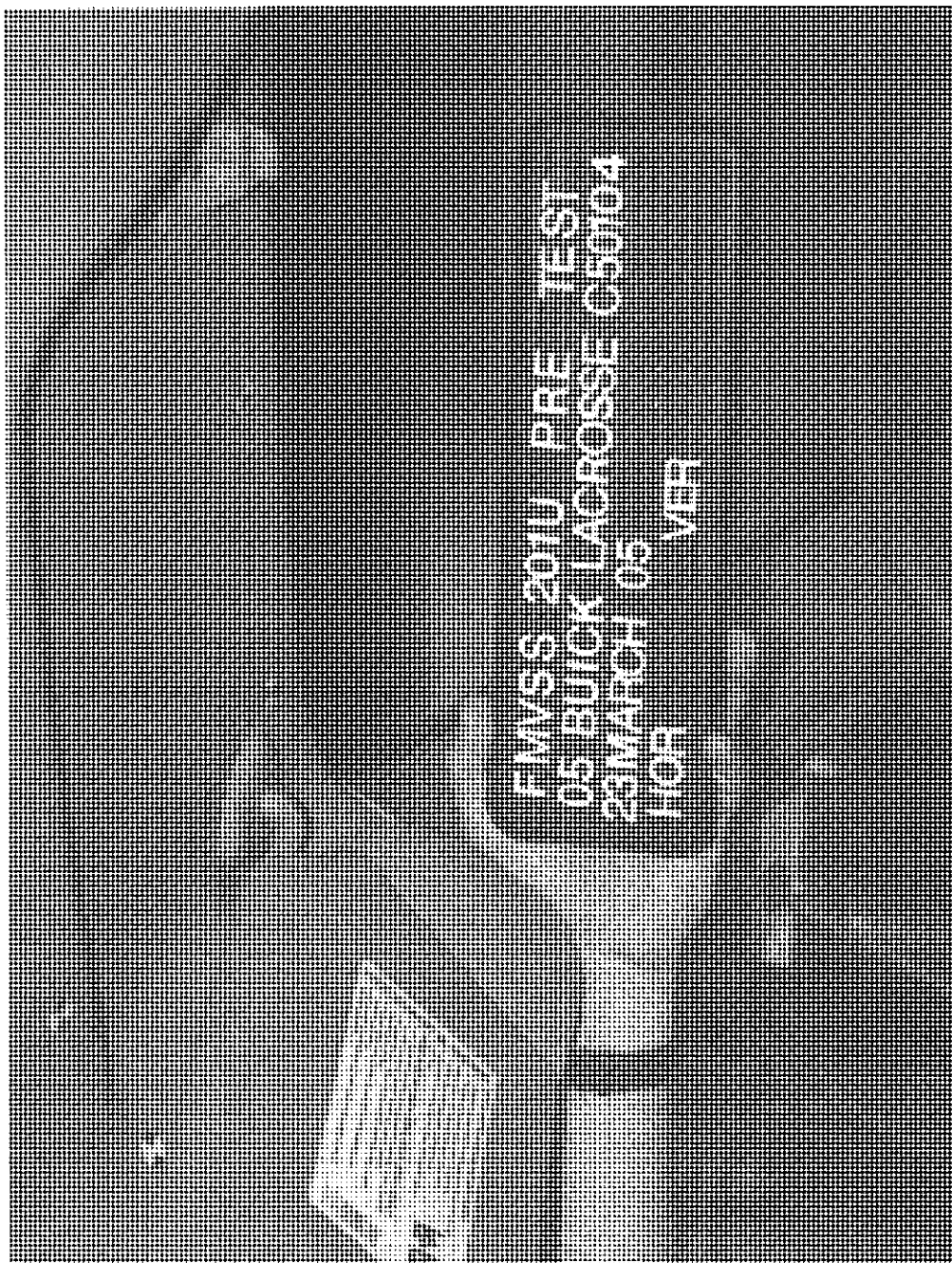


Figure A-8: PRE-TEST DRIVER SIDE FRONT HEADER



Figure A-9 . PRE-TEST DRIVER SIDE SIDE RAIL



FIGURE A-10: PRE-TEST DRIVER SIDE B-PILLAR

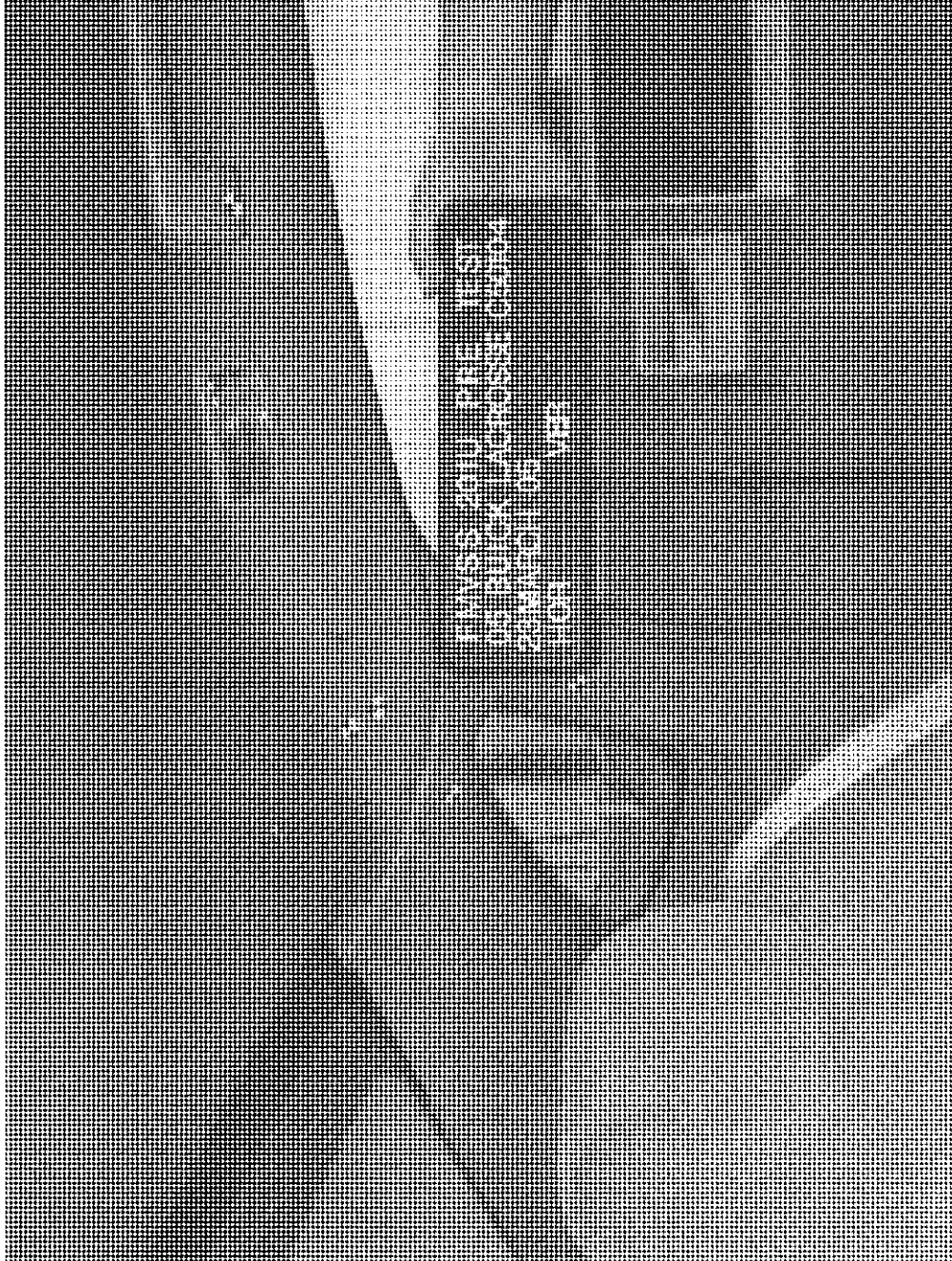


Figure A-11. PRE-TEST DRIVER SIDE REAR PILLAR

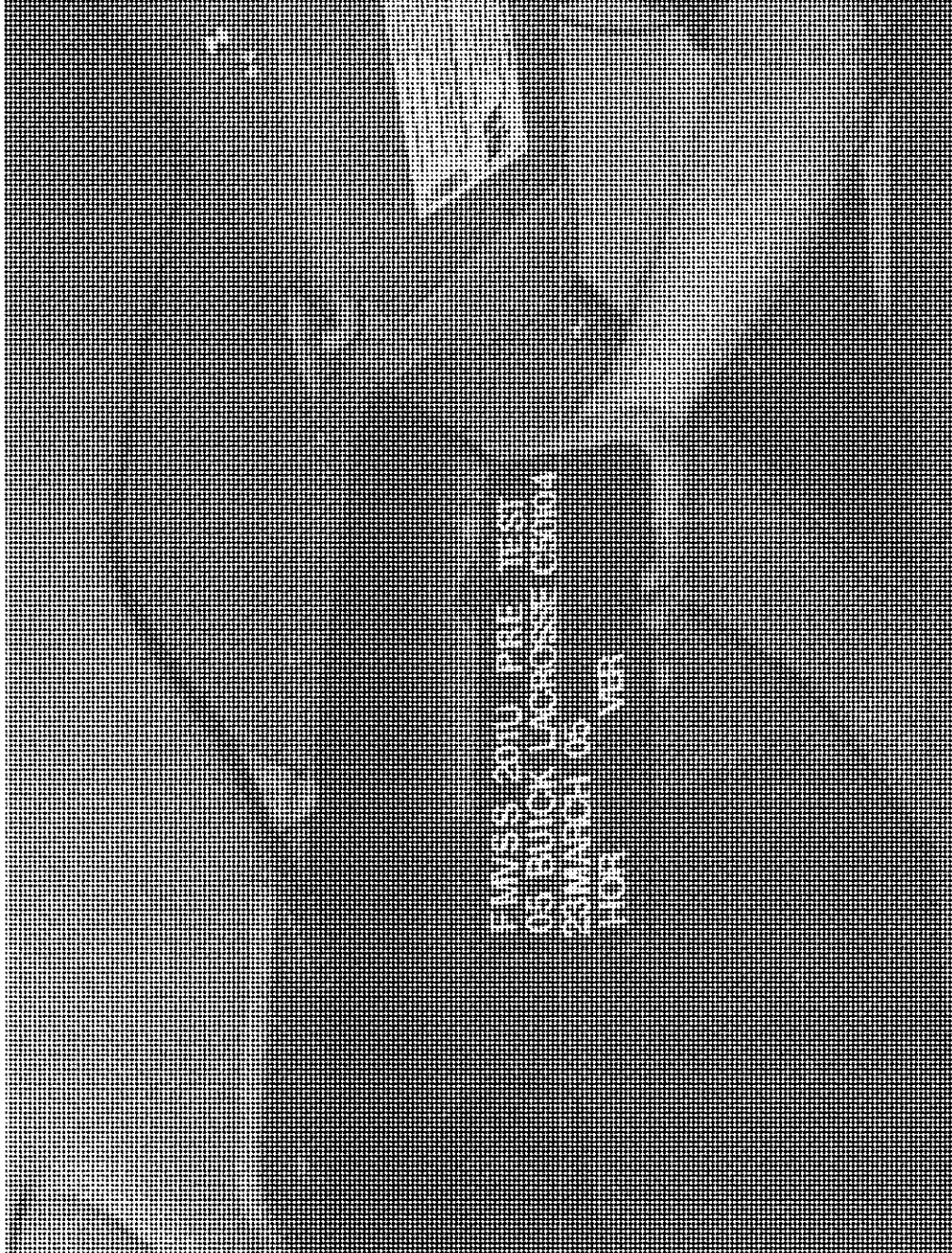


Figure A-13 PRE-TEST PASSENGER SIDE FRONT HEADER



Figure A.14 : PRE-TEST PASSENGER SIDE SIDE RAIL



Figure A-15: PRE-TEST PASSENGER SIDE B-PILLAR

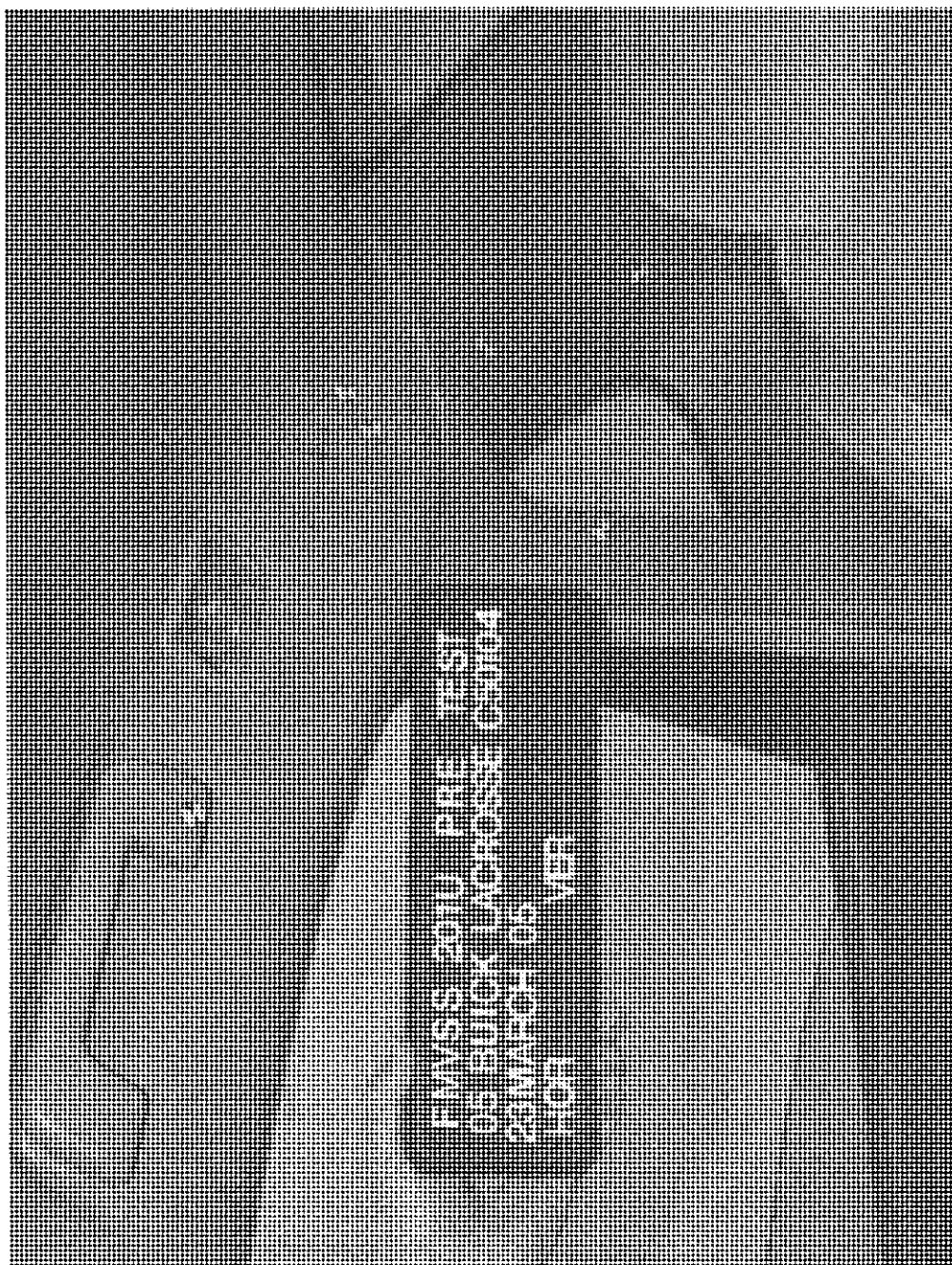


Figure A-16: PRE-TEST PASSENGER SIDE REAR PILLAR

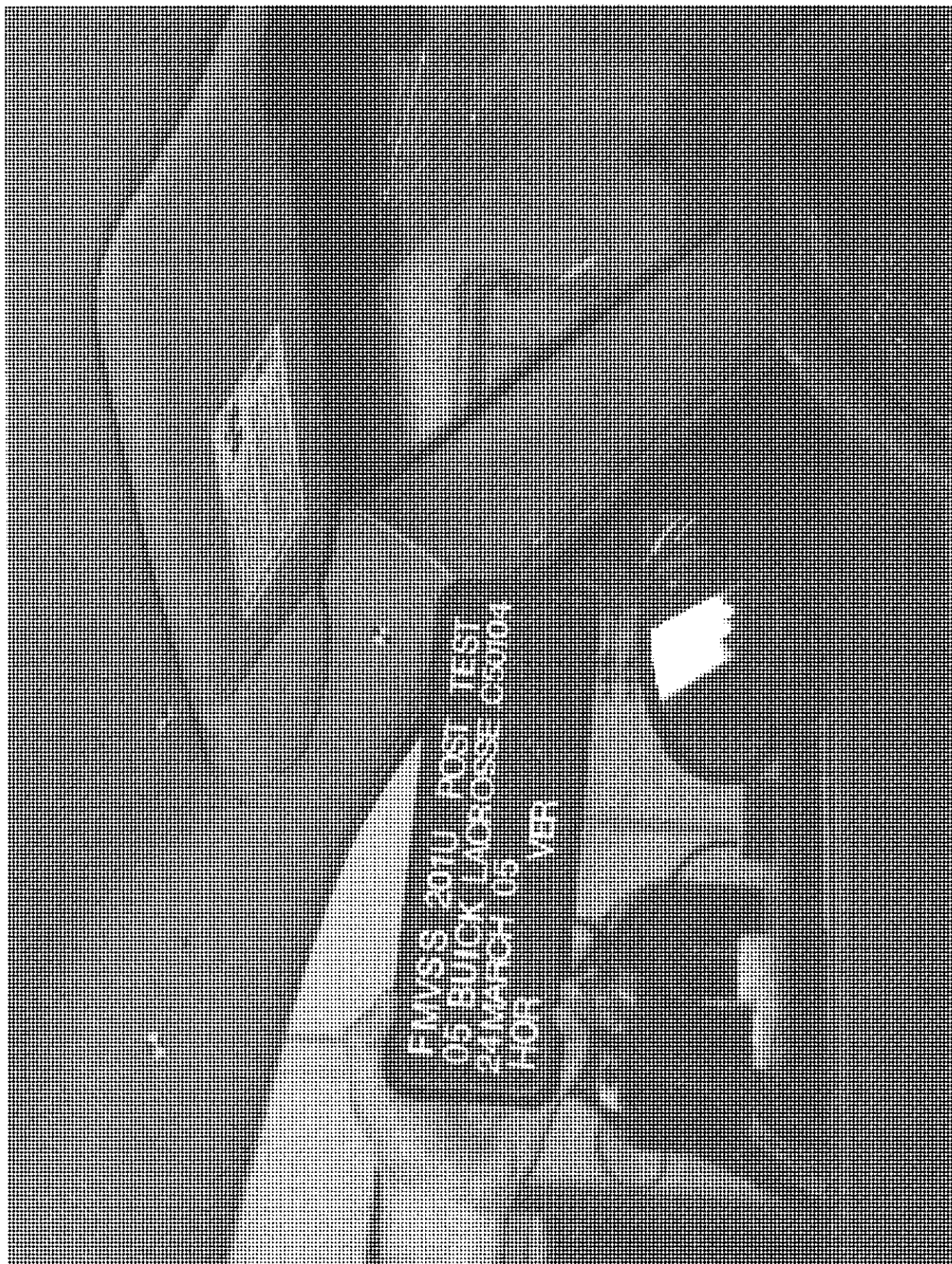


Figure A-17: POST-TEST DRIVER SIDE A-PILLAR

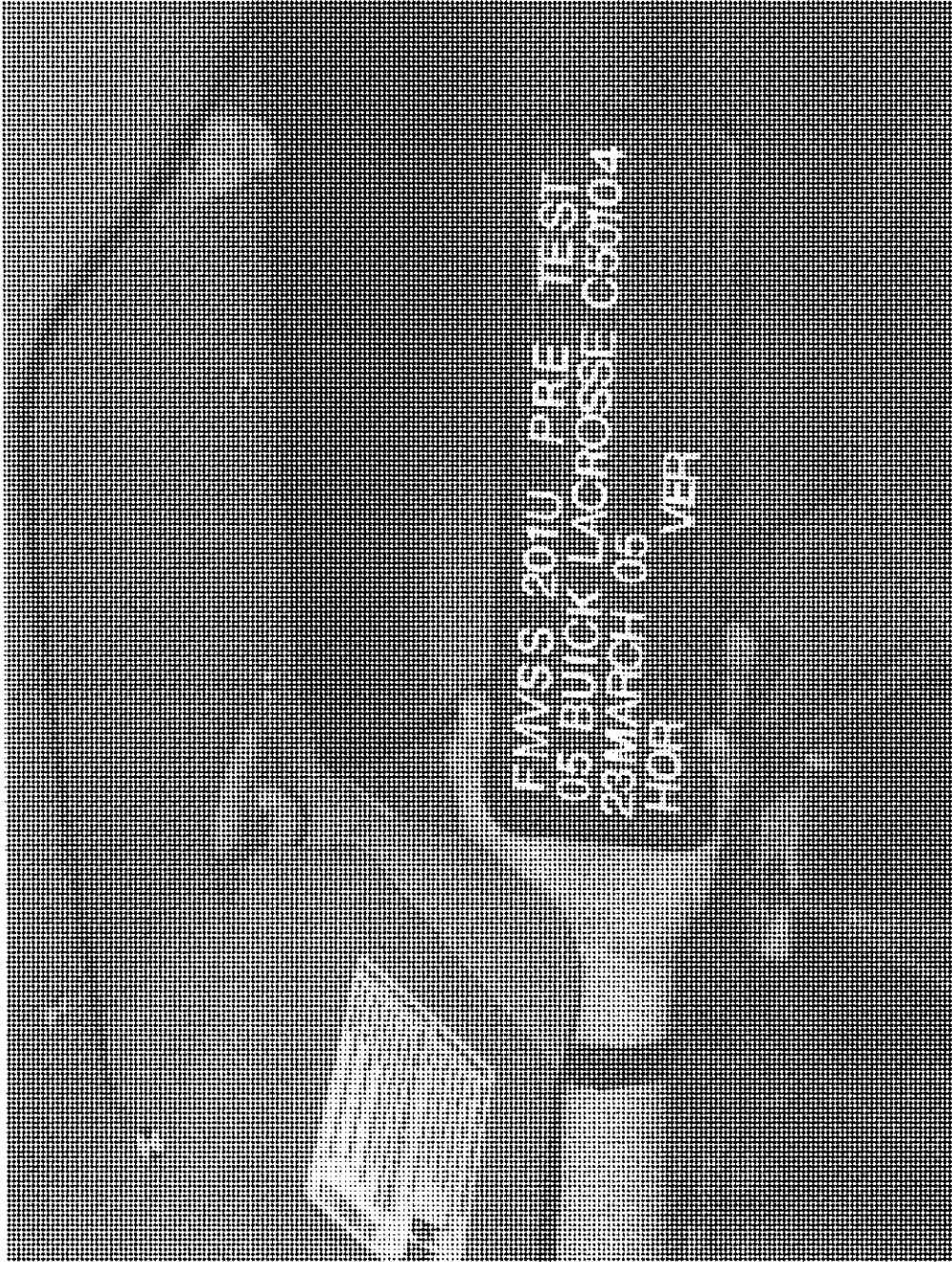


Figure A-18 : POST TEST DRIVER SIDE FRONT HEADER

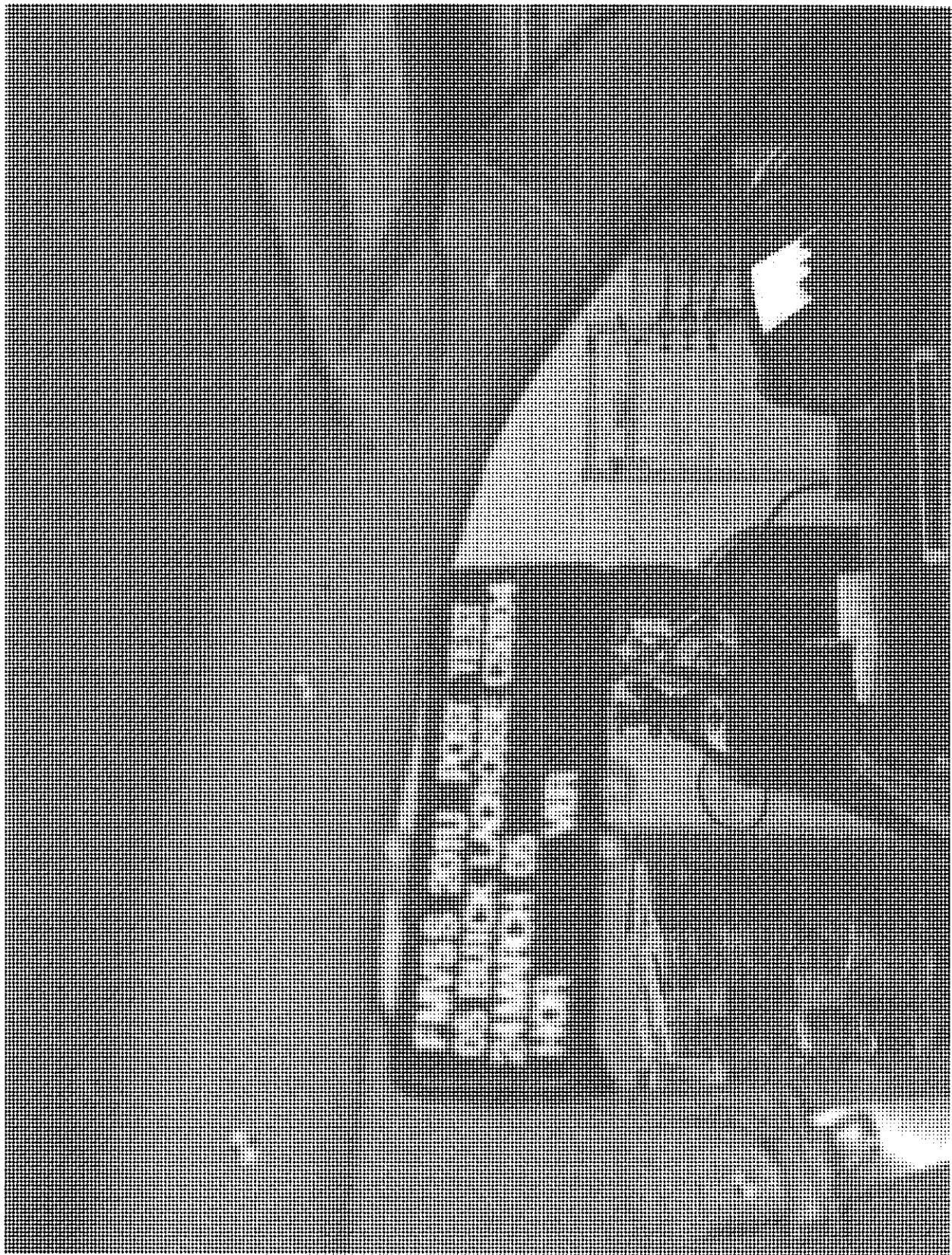


Figure A-15 : POST-TEST DRIVER SIDE SIDE RAIL

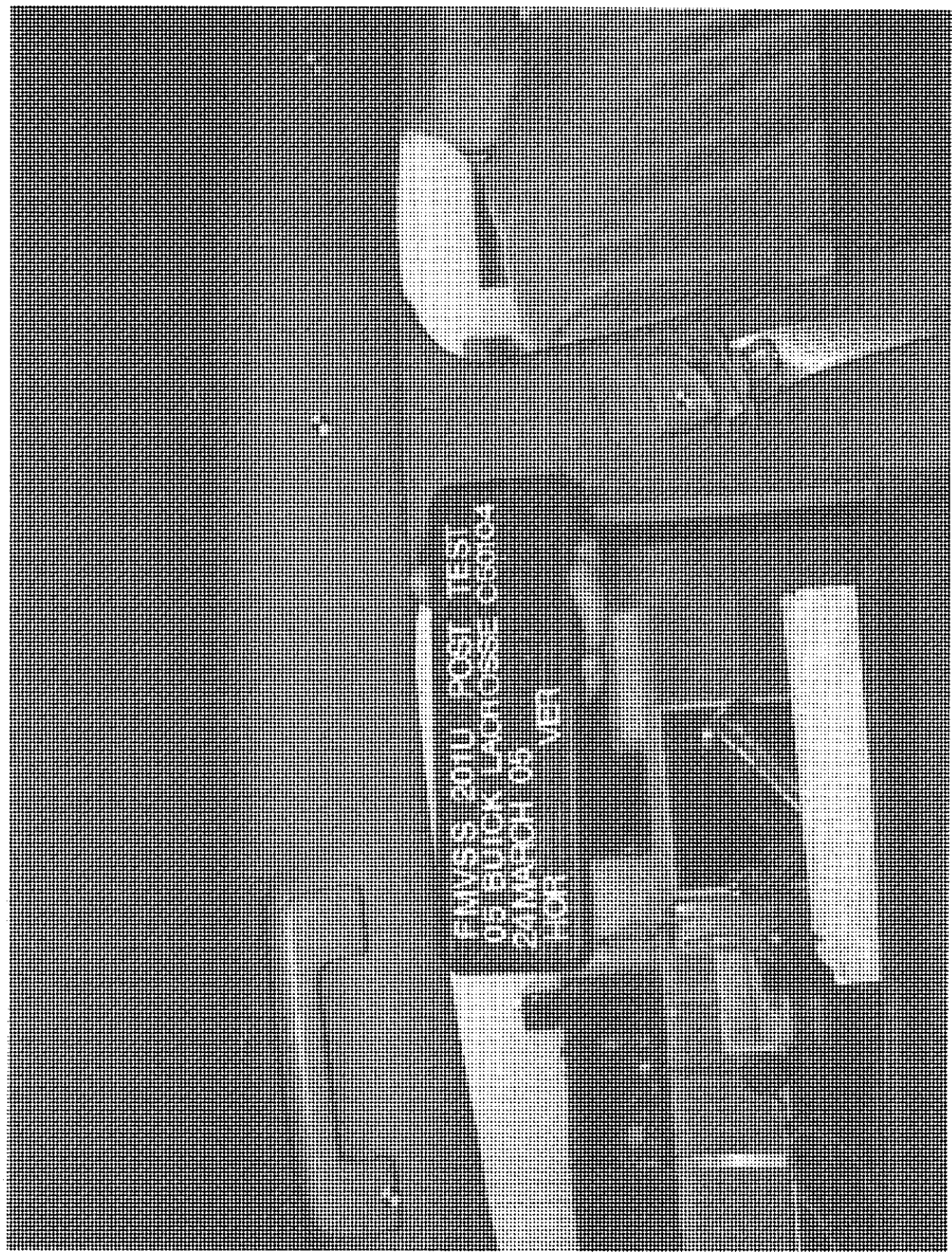


Figure A-20 : POST TEST DRIVER SIDE B-PILLAR

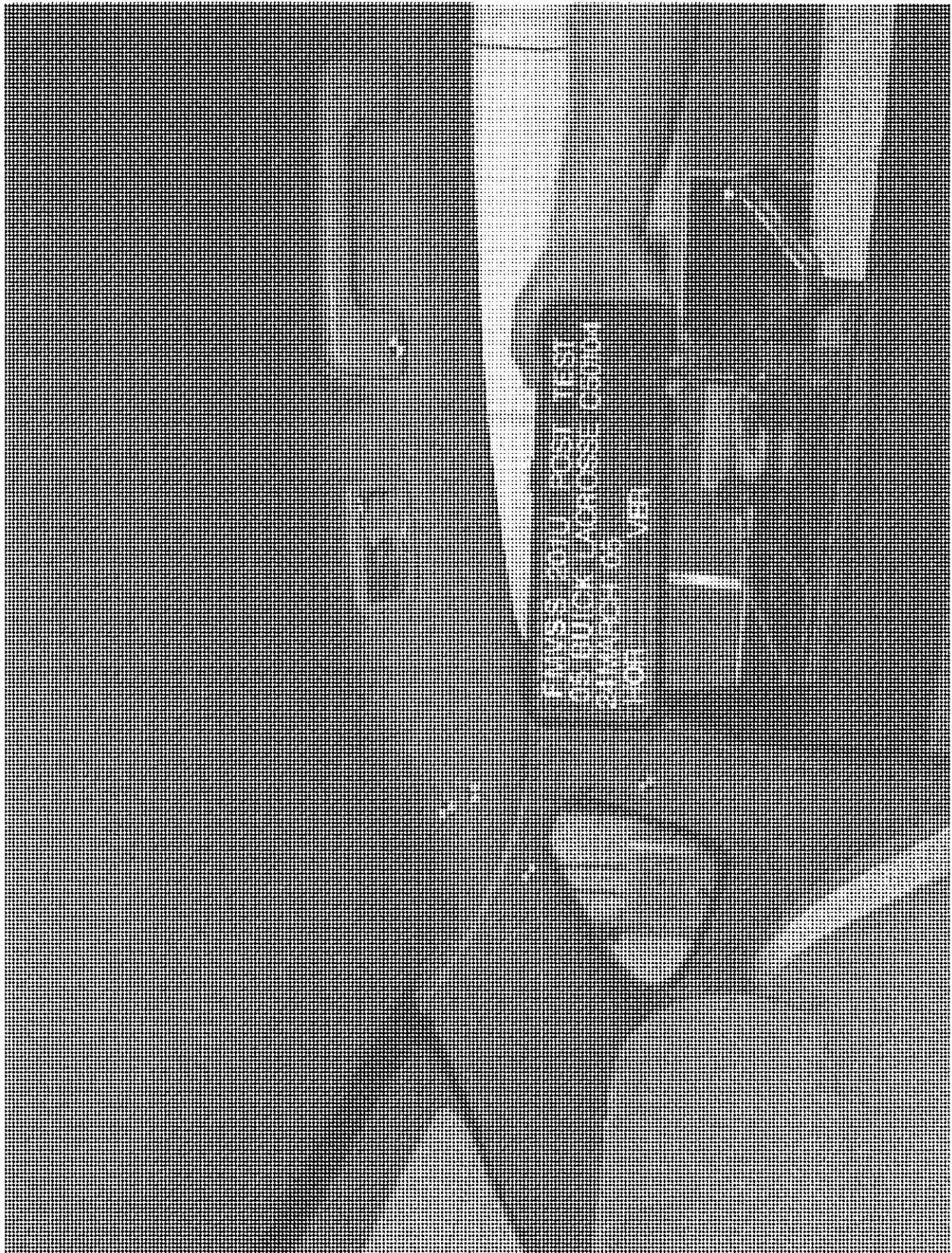


Figure A-21 - POST-TEST DRIVER SIDE REAR PILLAR



Figure A-22 - POST-TEST PASSENGER SIDE A-PILLAR

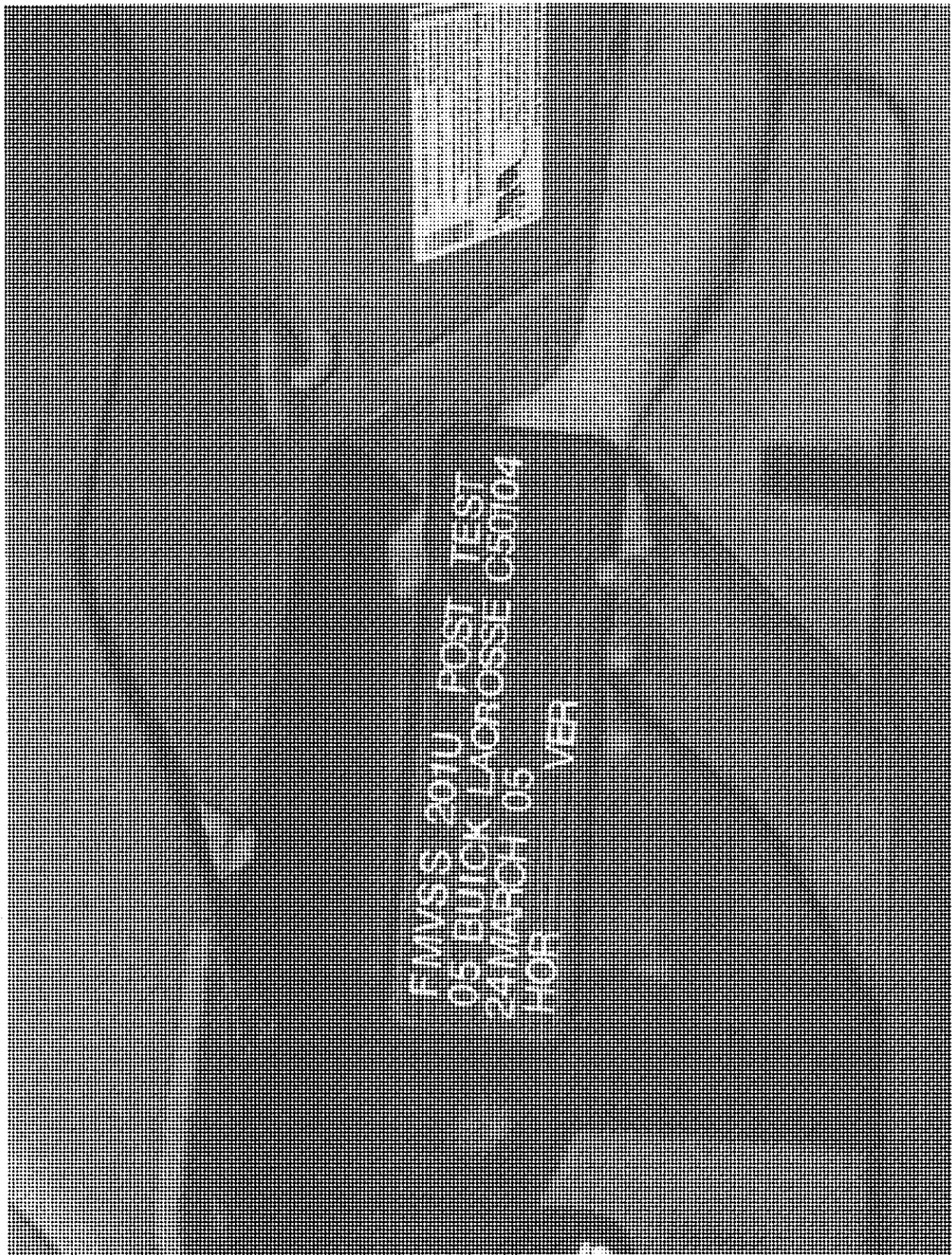


Figure A-23 : POST-TEST PASSENGER SIDE FRONT HEADER



Figure A-25 : POST-TEST PASSENGER SIDE B-PILLAR



Figure A-26. POST-TEST PASSENGER SIDE REAR PILLAR

APPENDIX B

PART 572L PERFORMANCE CALIBRATION IN SUPPORT OF VEHICLE SAFETY COMPLIANCE TESTING FOR OCCUPANT PROTECTION IN INTERIOR IMPACT

Appendix B contains the results from certification tests performed on the Free Motion Headforms utilized in this test program. The results indicate that the headforms meet all of the performance specifications given in 49 CFR Part 572 Subpart L.

The tests were conducted at the Dummy Certification Test Facility of Calspan Corporation. A summary of the test results are included in this Appendix.

**PART 572L
HEAD DROP PRE-TEST**

MANUFACTURER:		FIRST TECHNOLOGIES SAFETY SYSTEMS	
SERIAL NUMBER:		0642	
CALIBRATION DATE:		March 10, 2005	
TEST PARAMETER	SPECIFICATION	TEST RESULTS	
TEMPERATURE	19°C to 26°C	21.7	
RELATIVE HUMIDITY	10% to 70%	32	
PEAK RESULTANT ACCELERATION	225 Gs to 275 Gs	254.5	
PEAK LATERAL ACCELERATION	15 Gs Maximum	10.4	
IS ACCELERATION CURVE UNIMODAL?	YES	YES	

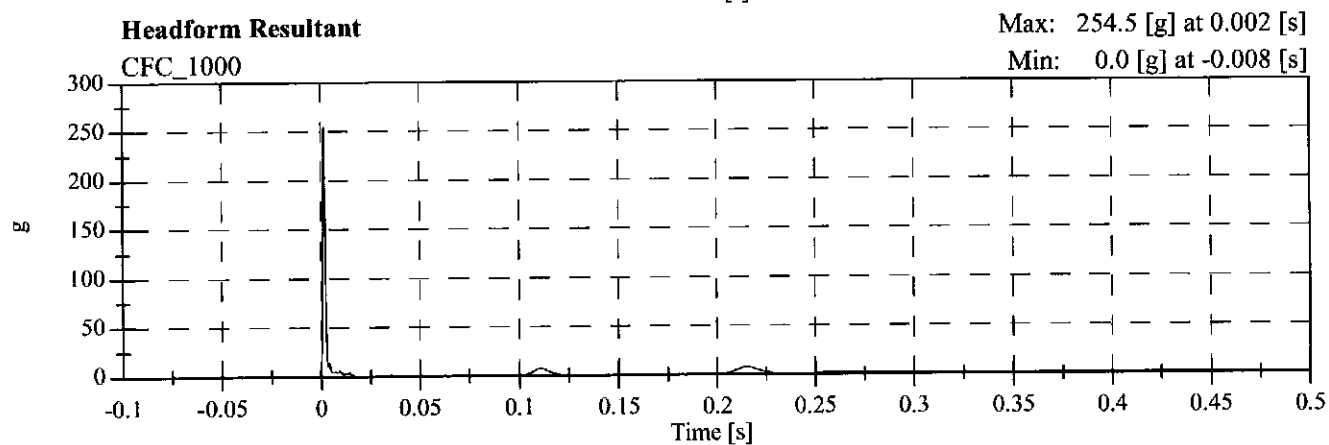
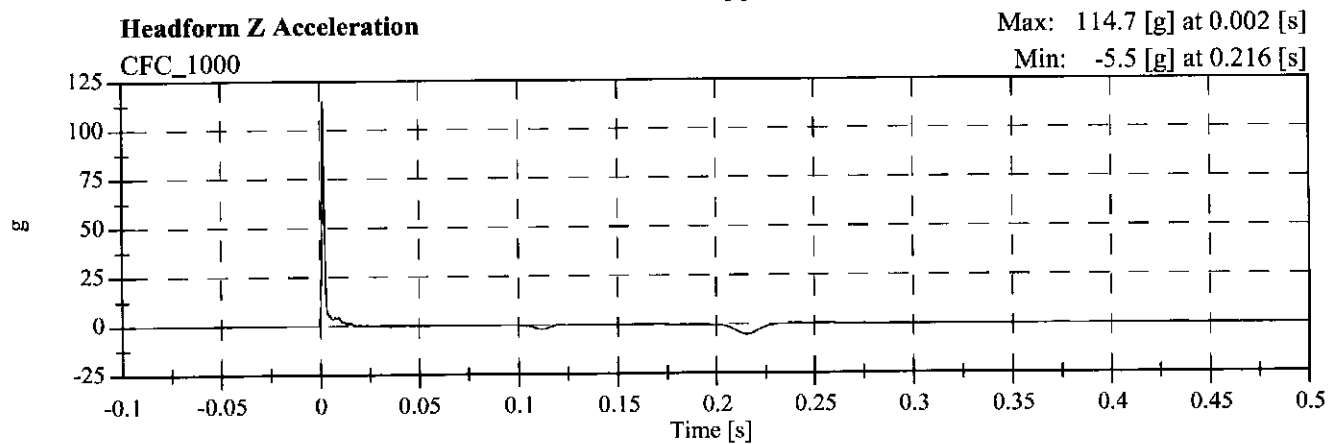
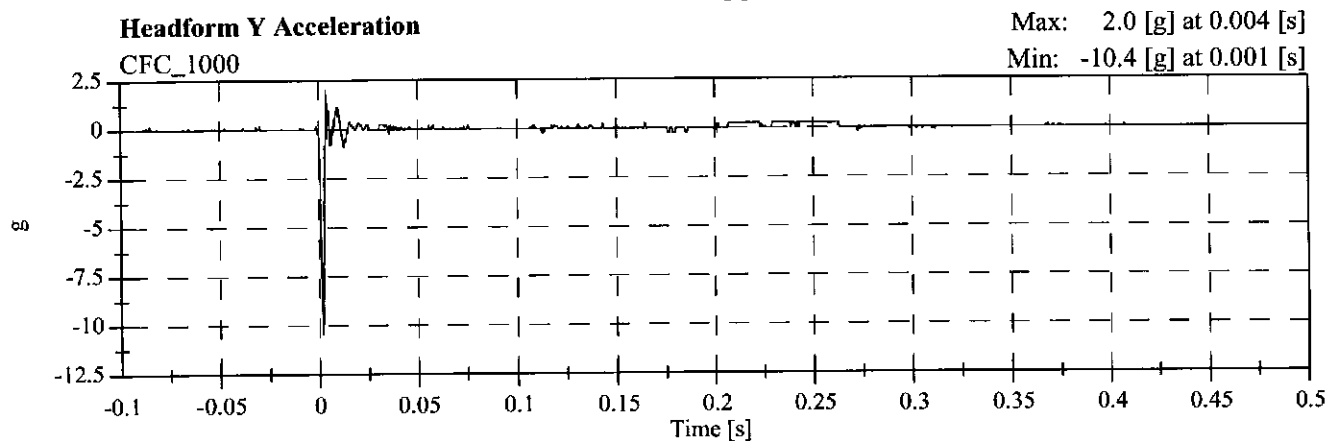
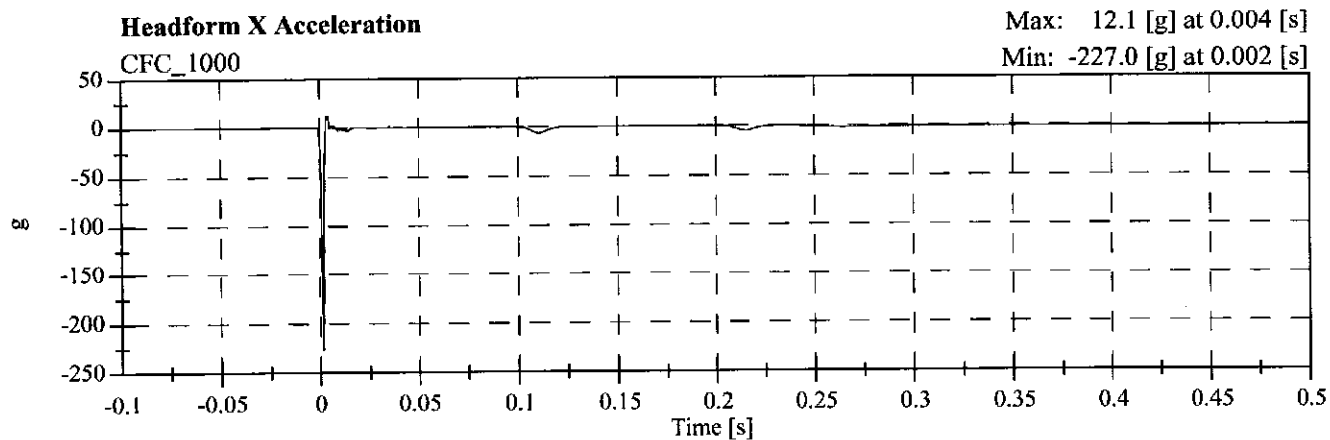
HEAD ACCELEROMETER CALIBRATION INFORMATION

I.D. NUMBER	MANUFACTURER	MODEL NUMBER	SERIAL NUMBER	DATE OF LAST CALIBRATION	DATE OF NEXT CALIBRATION
1 - LONGITUDINAL	ENDEVCO	7264-2000T	J24876	10/06/2004	04/06/2005
2 - LATERAL	ENDEVCO	7264-2000T	J33030	10/06/2004	04/06/2005
3 - VERTICAL	ENDEVCO	7264-2000T	J31009	10/06/2004	04/06/2005

REMARKS:

FMVSS 201U - Headform Calibration Drops

FMH0642 - March 10, 2005



**PART 572L
HEAD DROP PRE-TEST**

MANUFACTURER:		DENTON SAFETY SYSTEMS	
SERIAL NUMBER:		0062	
CALIBRATION DATE:		March 10, 2005	
TEST PARAMETER	SPECIFICATION		TEST RESULTS
TEMPERATURE	19°C to 26°C		21.7
RELATIVE HUMIDITY	10% to 70%		32
PEAK RESULTANT ACCELERATION	225 Gs to 275 Gs		227.7
PEAK LATERAL ACCELERATION	15 Gs Maximum		11.5
IS ACCELERATION CURVE UNIMODAL?	YES		YES

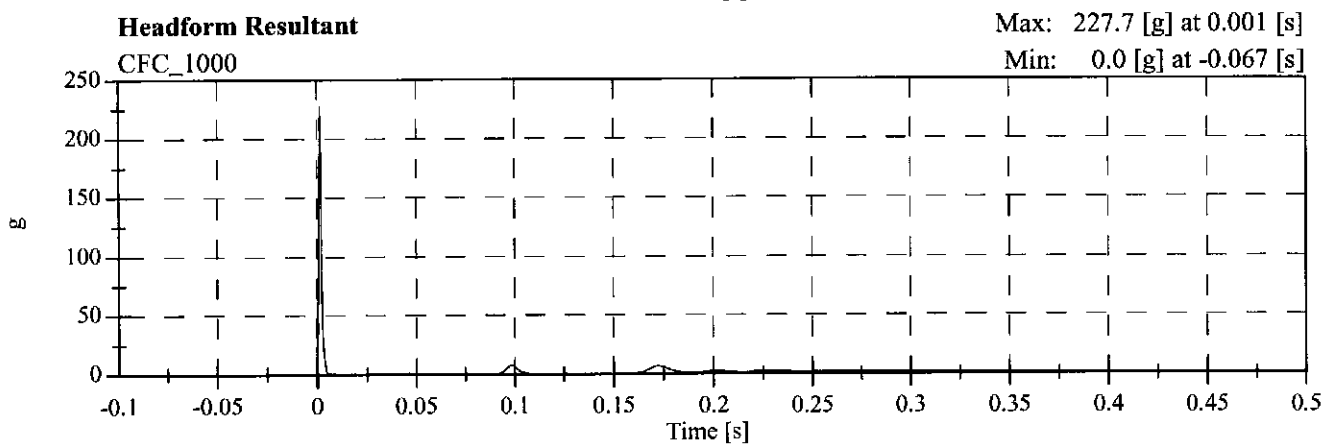
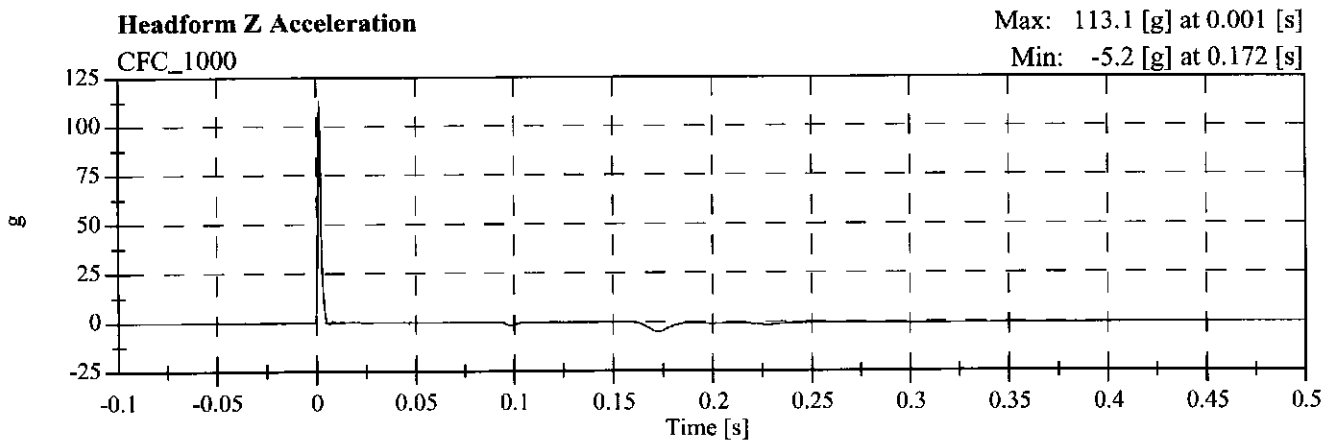
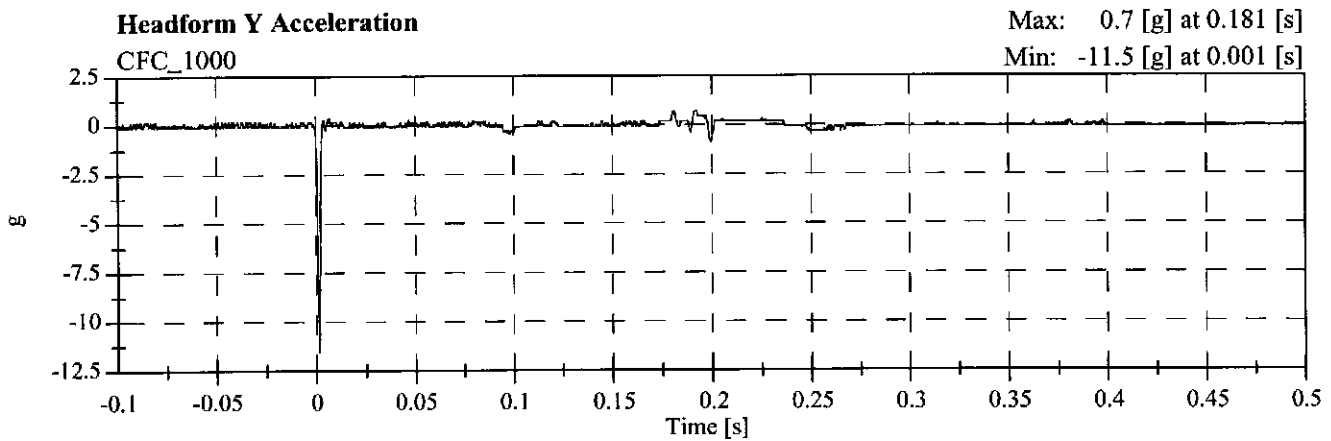
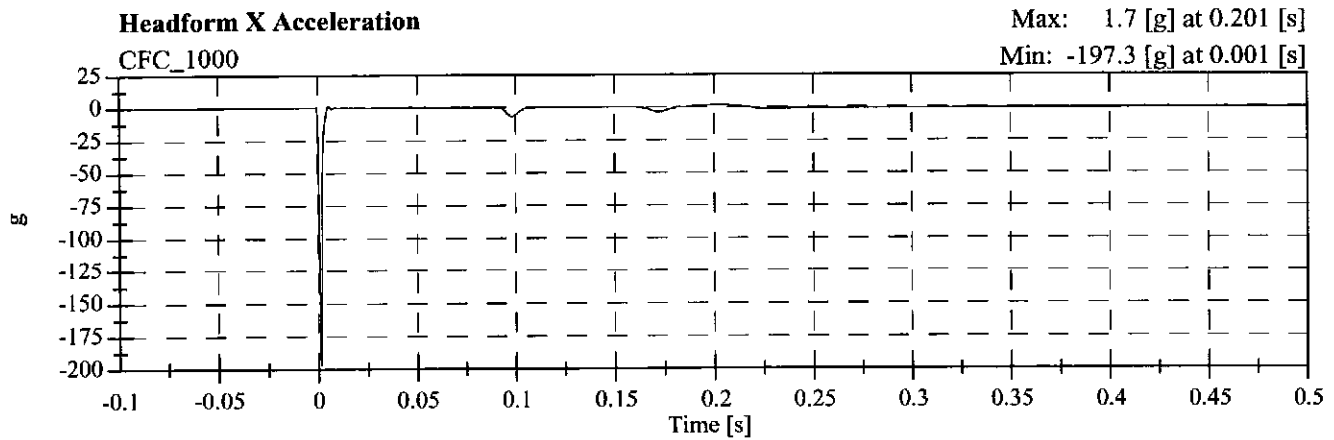
HEAD ACCELEROMETER CALIBRATION INFORMATION

I.D. NUMBER	MANUFACTURER	MODEL NUMBER	SERIAL NUMBER	DATE OF LAST CALIBRATION	DATE OF NEXT CALIBRATION
1 - LONGITUDINAL	ENDEVCO	7264-2000T	J33127	10/06/2004	04/06/2005
2 - LATERAL	ENDEVCO	7264-2000T	J33019	10/06/2004	04/06/2005
3 - VERTICAL	ENDEVCO	7264-2000T	J32782	10/06/2004	04/06/2005

REMARKS:

FMVSS 201U - Headform Calibration Drops

FMH0062 - March 10, 2005



**PART 572L
HEAD DROP PRE-TEST**

MANUFACTURER:		FIRST TECHNOLOGIES SAFETY SYSTEMS	
SERIAL NUMBER:		805	
CALIBRATION DATE:		March 10, 2005	
TEST PARAMETER	SPECIFICATION	TEST RESULTS	
TEMPERATURE	19°C to 26°C	21.7	
RELATIVE HUMIDITY	10% to 70%	32	
PEAK RESULTANT ACCELERATION	225 Gs to 275 Gs	230.6	
PEAK LATERAL ACCELERATION	15 Gs Maximum	10.2	
IS ACCELERATION CURVE UNIMODAL?	YES	YES	

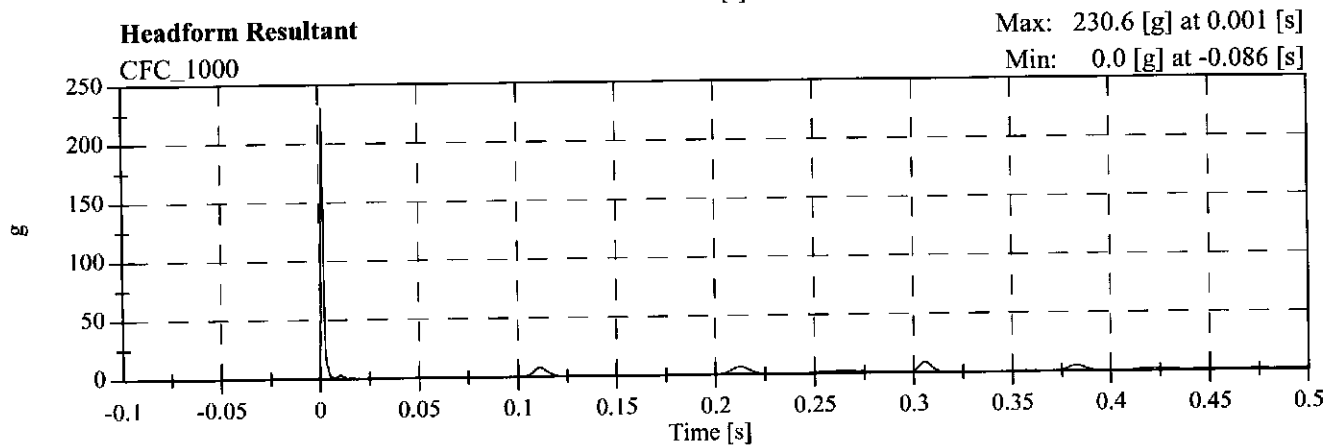
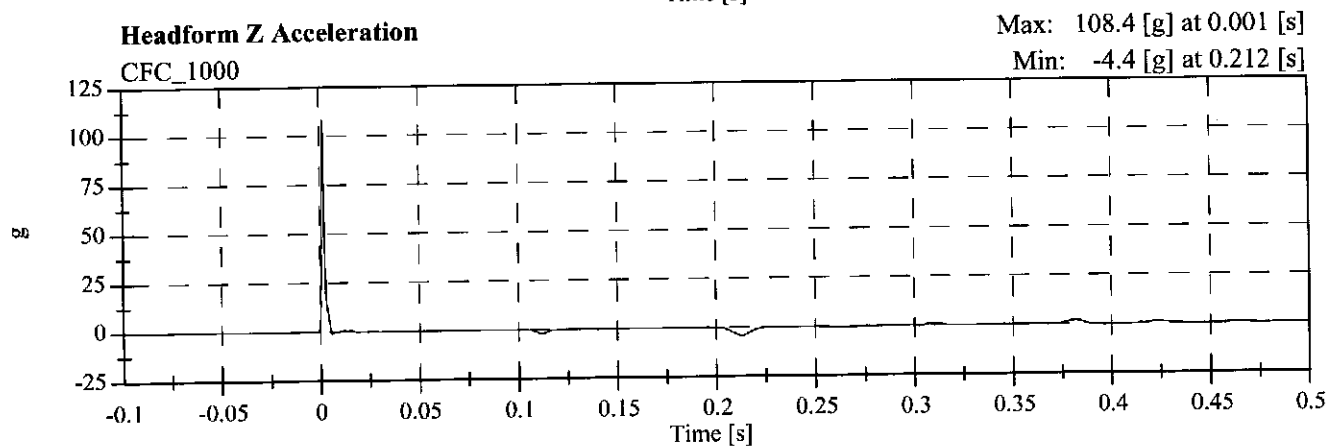
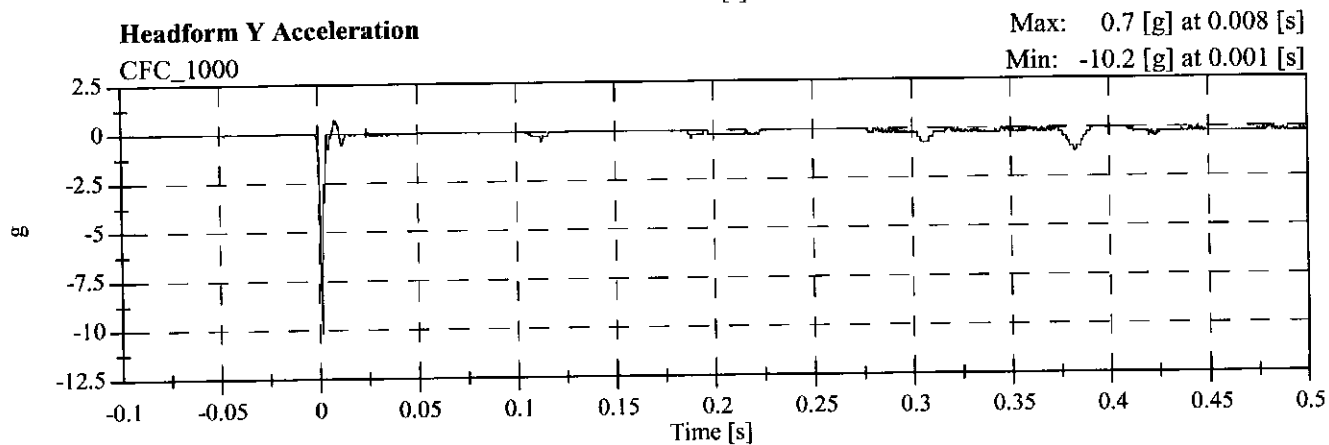
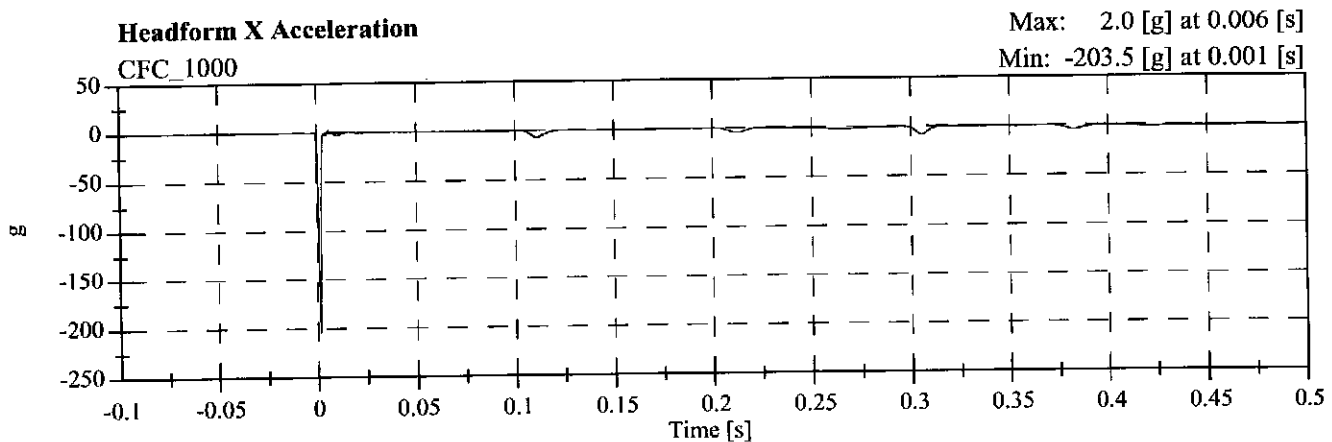
HEAD ACCELEROMETER CALIBRATION INFORMATION

I.D. NUMBER	MANUFACTURER	MODEL NUMBER	SERIAL NUMBER	DATE OF LAST CALIBRATION	DATE OF NEXT CALIBRATION
1 - LONGITUDINAL	ENDEVCO	7264-2000T	J38127	10/06/2004	04/06/2005
2 - LATERAL	ENDEVCO	7264-2000T	J37980	10/06/2004	04/06/2005
3 - VERTICAL	ENDEVCO	7264-2000T	J37854	10/06/2004	04/06/2005

REMARKS:

FMVSS 201U - Headform Calibration Drops

FMH0805 - March 10, 2005



**PART 572L
HEAD DROP PRE-TEST**

MANUFACTURER:		DENTON SAFETY SYSTEMS	
SERIAL NUMBER:		0355	
CALIBRATION DATE:		March 10, 2005	
TEST PARAMETER	SPECIFICATION		TEST RESULTS
TEMPERATURE	19°C to 26°C		21.7
RELATIVE HUMIDITY	10% to 70%		32
PEAK RESULTANT ACCELERATION	225 Gs to 275 Gs		236.5
PEAK LATERAL ACCELERATION	15 Gs Maximum		5.3
IS ACCELERATION CURVE UNIMODAL?	YES		YES

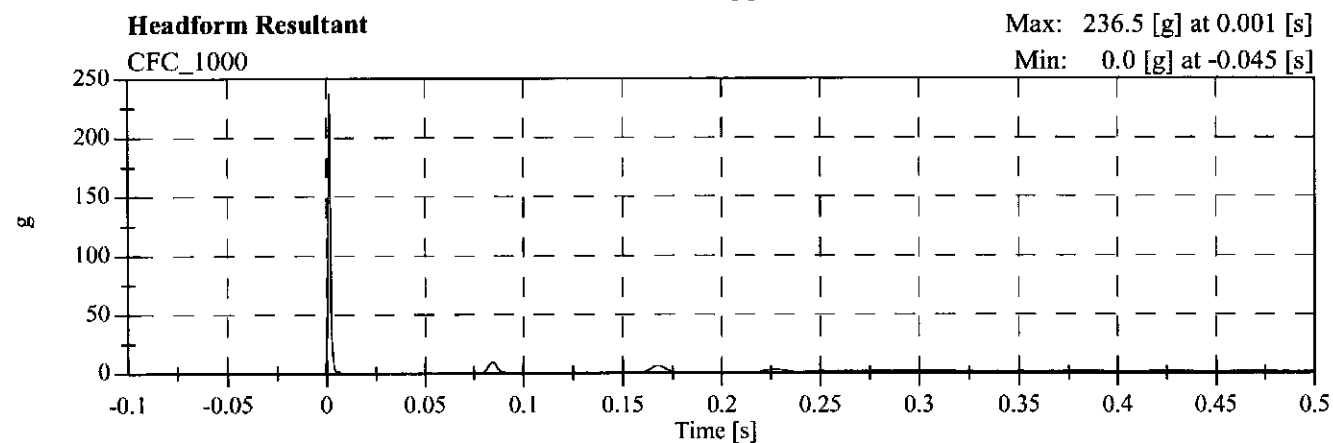
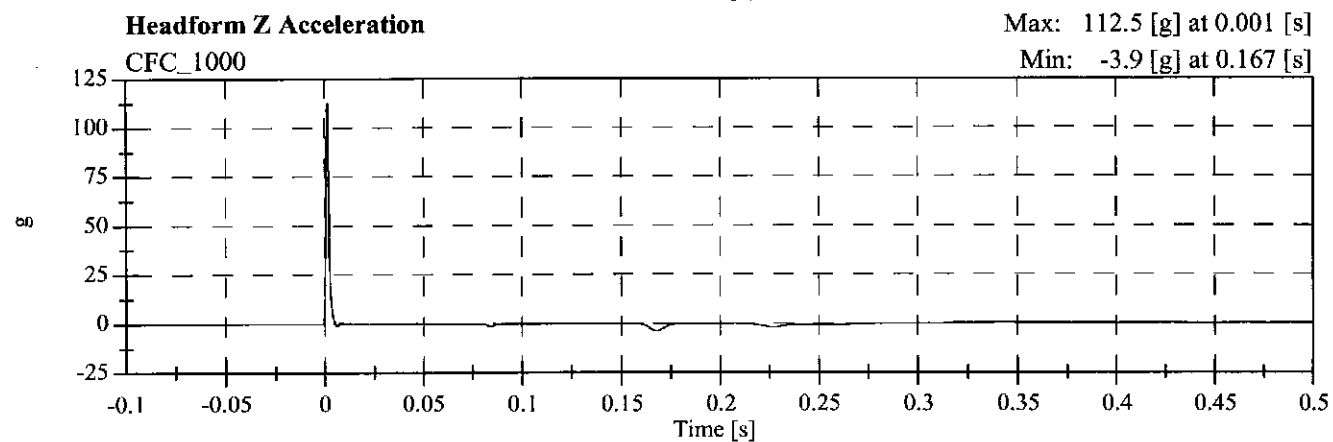
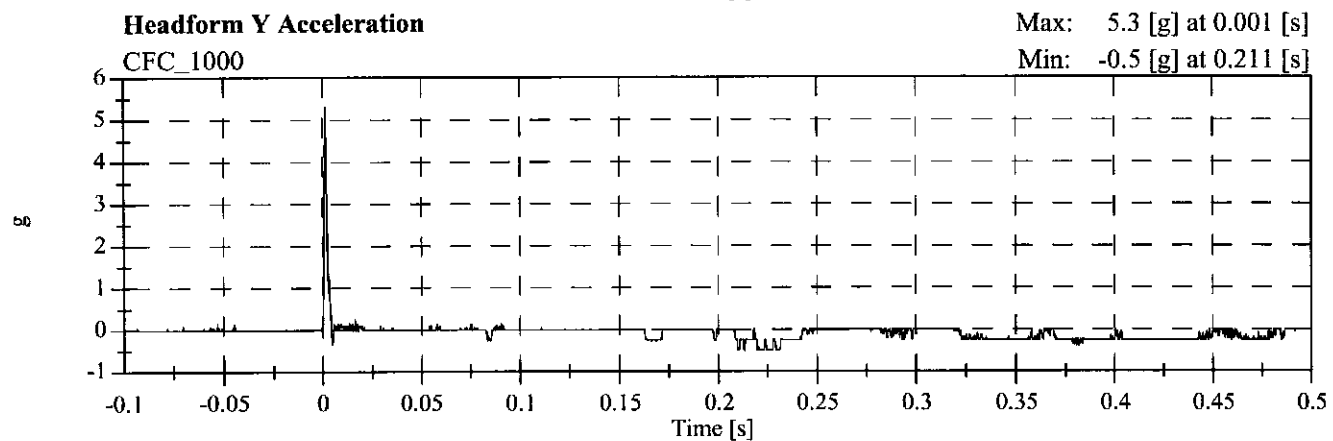
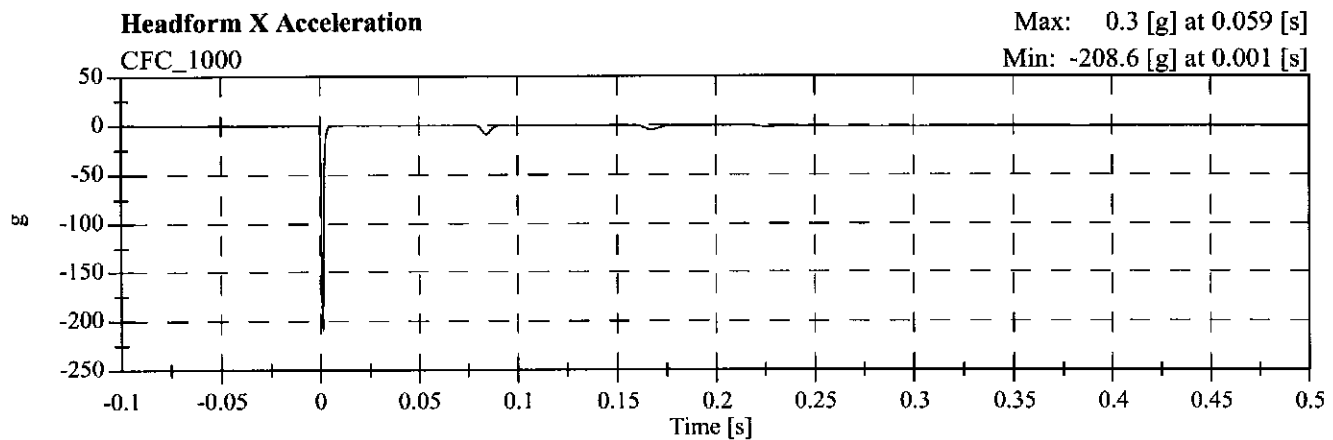
HEAD ACCELEROMETER CALIBRATION INFORMATION

I.D. NUMBER	MANUFACTURER	MODEL NUMBER	SERIAL NUMBER	DATE OF LAST CALIBRATION	DATE OF NEXT CALIBRATION
1 - LONGITUDINAL	ENDEVCO	7264-2000T	J28671	10/06/2004	04/06/2005
2 - LATERAL	ENDEVCO	7264-2000T	J32779	10/06/2004	04/06/2005
3 - VERTICAL	ENDEVCO	7264-2000T	J25854	10/06/2004	04/06/2005

REMARKS:

FMVSS 201U - Headform Calibration Drops

FMH0355 - March 10, 2005



**PART 572L
HEAD DROP PRE-TEST**

MANUFACTURER:		FIRST TECHNOLOGIES SAFETY SYSTEMS	
SERIAL NUMBER:		1255	
CALIBRATION DATE:		March 10, 2005	
TEST PARAMETER	SPECIFICATION		TEST RESULTS
TEMPERATURE	19°C to 26°C		21.7
RELATIVE HUMIDITY	10% to 70%		32
PEAK RESULTANT ACCELERATION	225 Gs to 275 Gs		257.3
PEAK LATERAL ACCELERATION	15 Gs Maximum		2.7
IS ACCELERATION CURVE UNIMODAL?	YES		YES

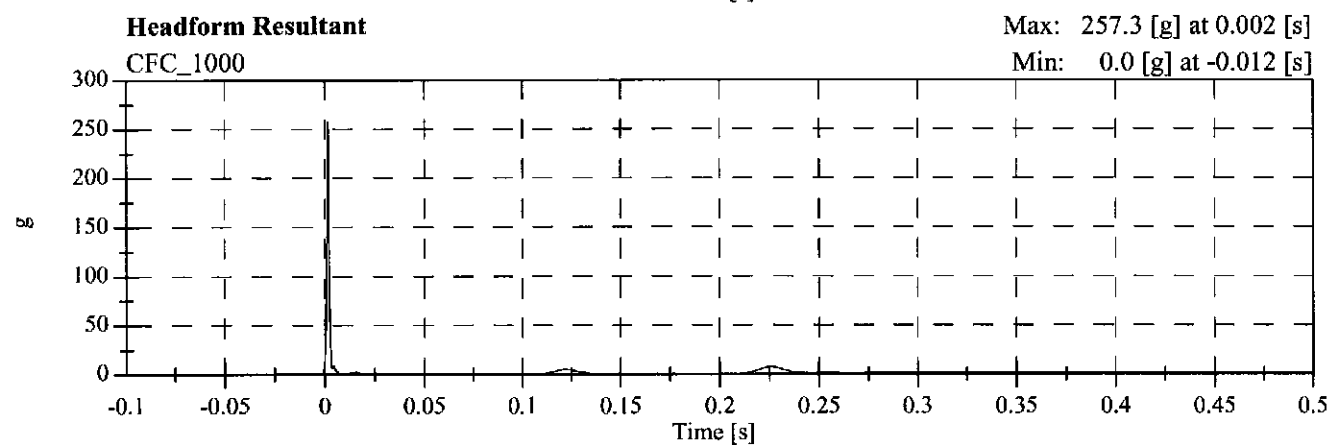
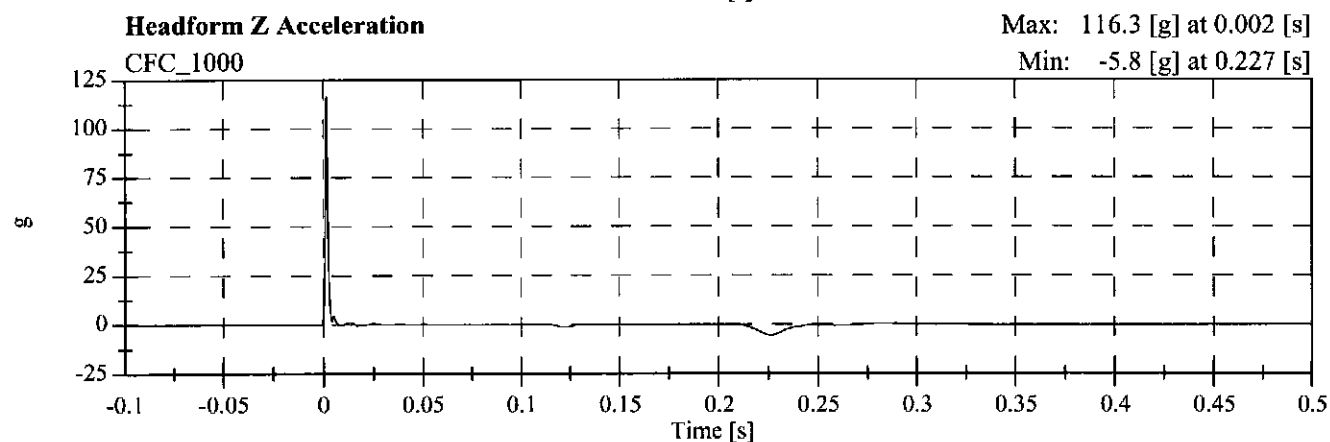
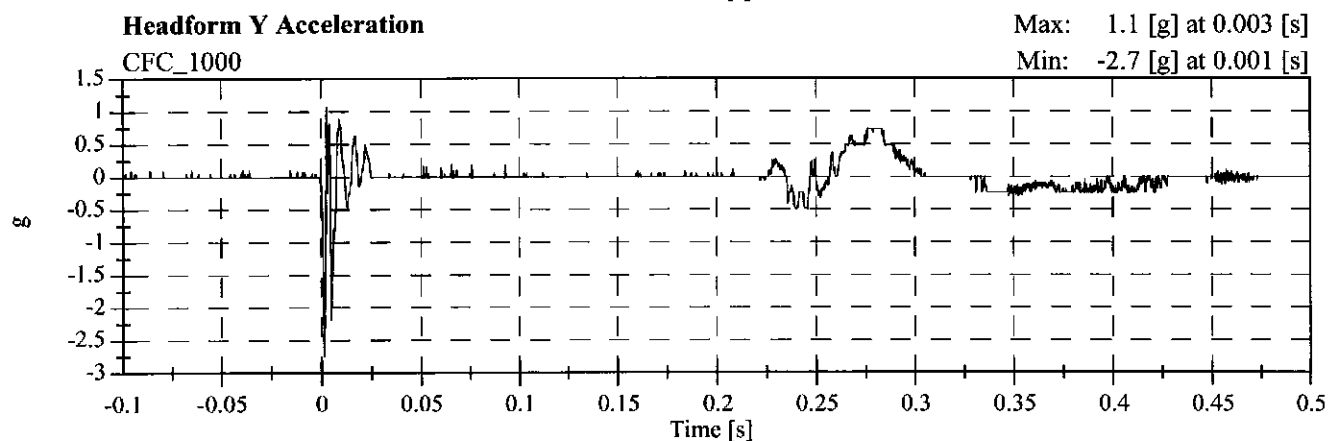
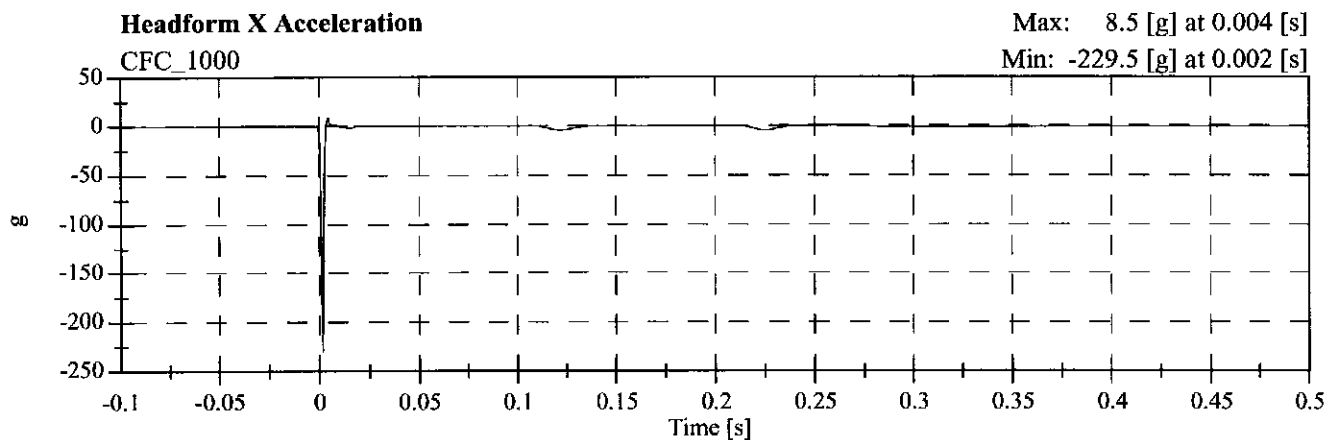
HEAD ACCELEROMETER CALIBRATION INFORMATION

I.D. NUMBER	MANUFACTURER	MODEL NUMBER	SERIAL NUMBER	DATE OF LAST CALIBRATION	DATE OF NEXT CALIBRATION
1 - LONGITUDINAL	ENDEVCO	7264-2000T	J41006	10/06/2004	04/06/2005
2 - LATERAL	ENDEVCO	7264-2000T	J40994	10/06/2004	04/06/2005
3 - VERTICAL	ENDEVCO	7264-2000T	J41007	10/06/2004	04/06/2005

REMARKS:

FMVSS 201U - Headform Calibration Drops

FMH1255 - March 10, 2005



**PART 572L
HEAD DROP POST-TEST**

MANUFACTURER:		DENTON SAFETY SYSTEMS
SERIAL NUMBER:		0642
CALIBRATION DATE:		March 24, 2005
TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	19°C to 26°C	23.9
RELATIVE HUMIDITY	10% to 70%	20
PEAK RESULTANT ACCELERATION	225 Gs to 275 Gs	248.4
PEAK LATERAL ACCELERATION	15 Gs Maximum	1.3
IS ACCELERATION CURVE UNIMODAL?	YES	YES

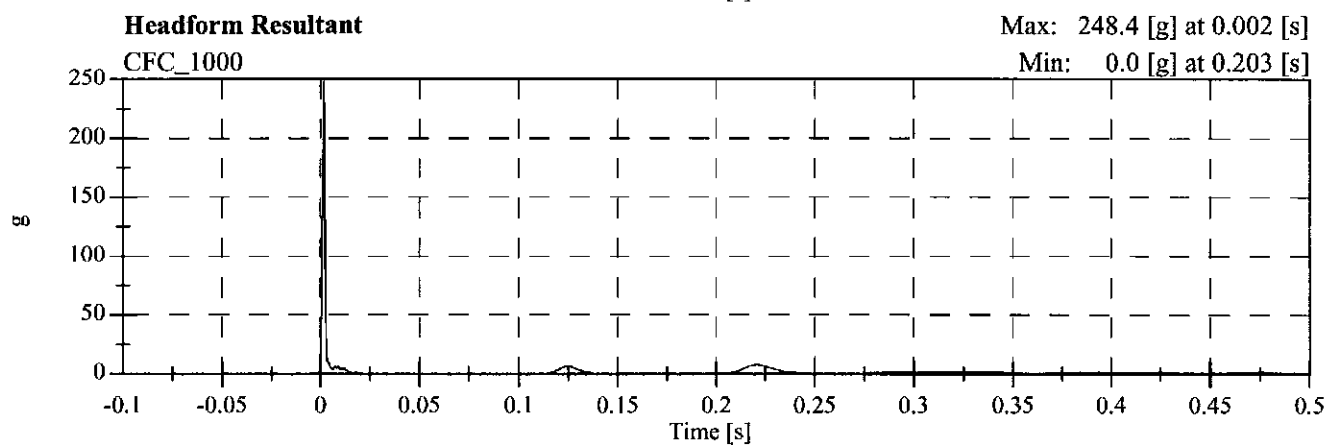
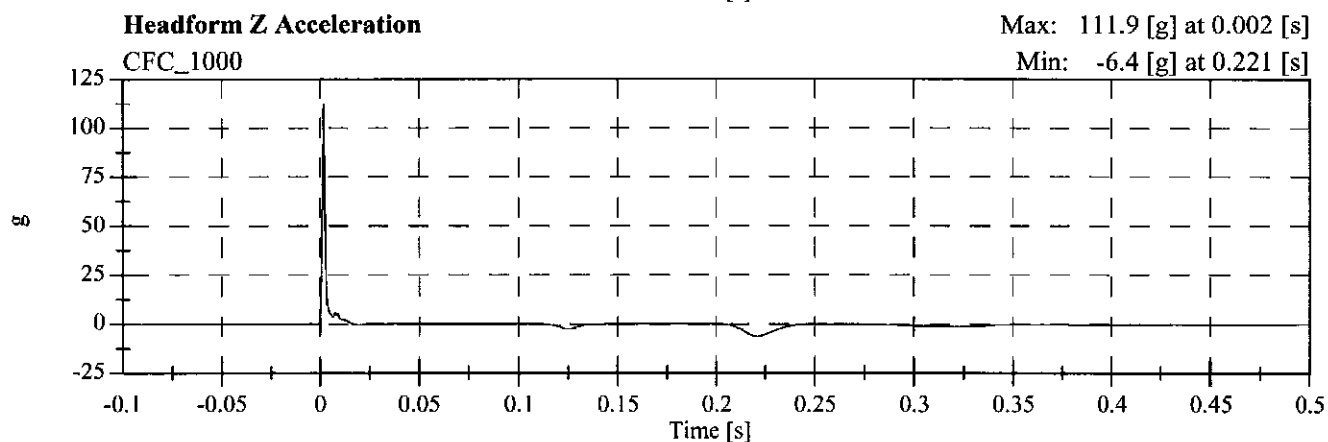
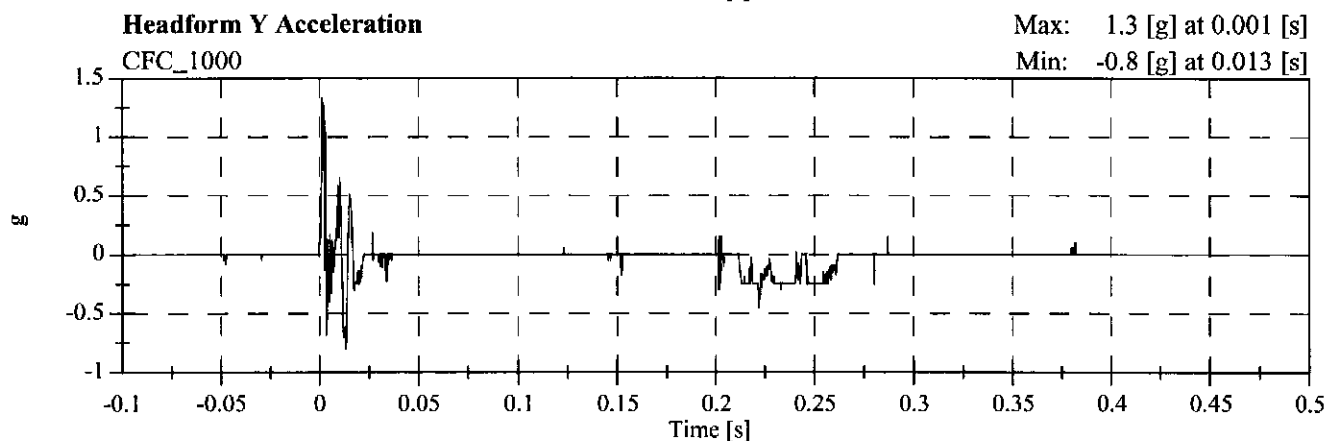
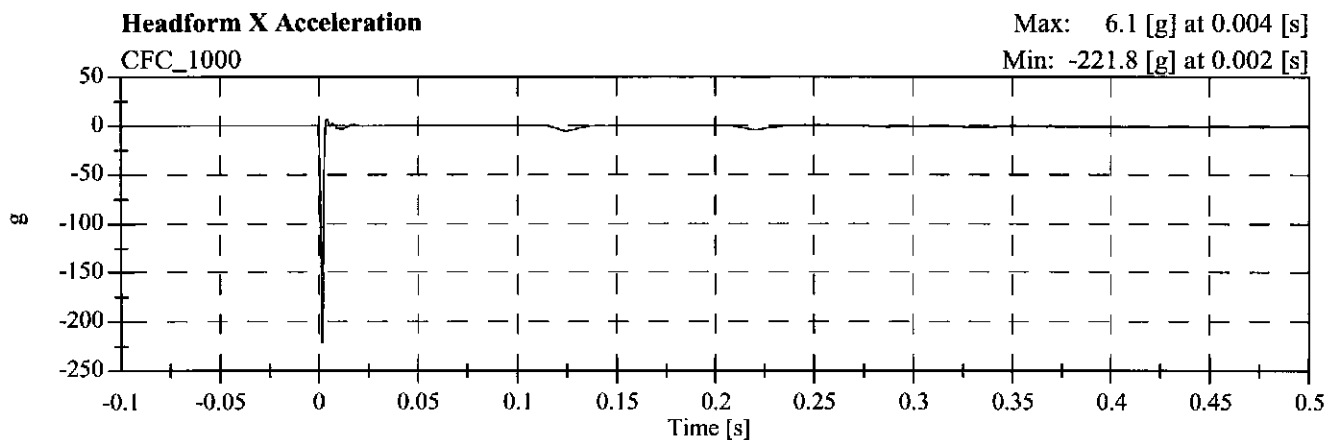
HEAD ACCELEROMETER CALIBRATION INFORMATION

I.D. NUMBER	MANUFACTURER	MODEL NUMBER	SERIAL NUMBER	DATE OF LAST CALIBRATION	DATE OF NEXT CALIBRATION
1 - LONGITUDINAL	ENDEVCO	7264-2000T	J24876	03/16/05	09/16/05
2 - LATERAL	ENDEVCO	7264-2000T	J33030	03/16/05	09/16/05
3 - VERTICAL	ENDEVCO	7264-2000T	J31009	03/16/05	09/16/05

REMARKS:

FMVSS 201U - Headform Calibration Drops

FMH0642 - March 24, 2005



**PART 572L
HEAD DROP POST-TEST**

MANUFACTURER:		FIRST TECHNOLOGIES SAFETY SYSTEMS	
SERIAL NUMBER:		0062	
CALIBRATION DATE:		March 24, 2005	
TEST PARAMETER	SPECIFICATION		TEST RESULTS
TEMPERATURE	19°C to 26°C		23.9
RELATIVE HUMIDITY	10% to 70%		20
PEAK RESULTANT ACCELERATION	225 Gs to 275 Gs		243.9
PEAK LATERAL ACCELERATION	15 Gs Maximum		5.0
IS ACCELERATION CURVE UNIMODAL?	YES		YES

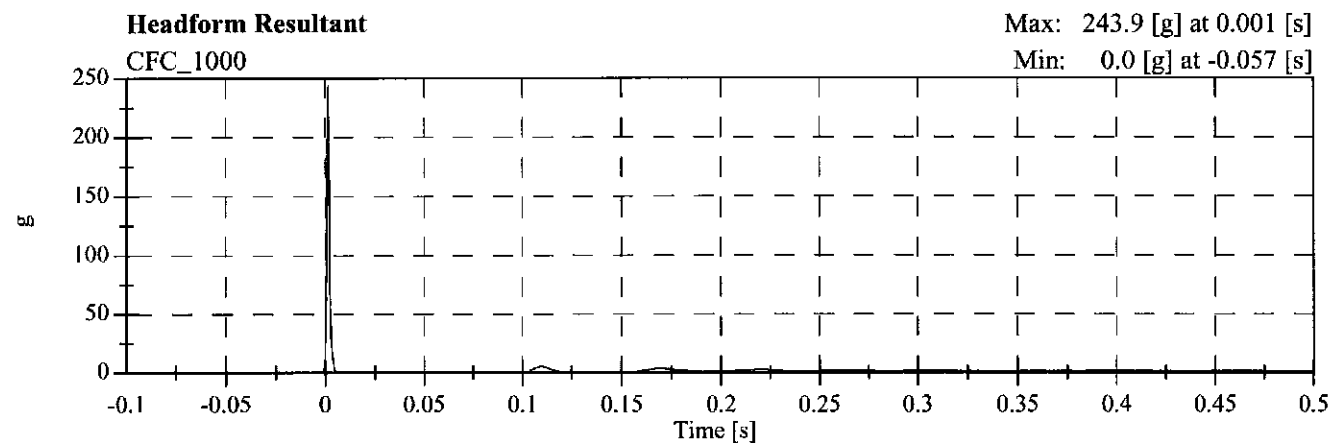
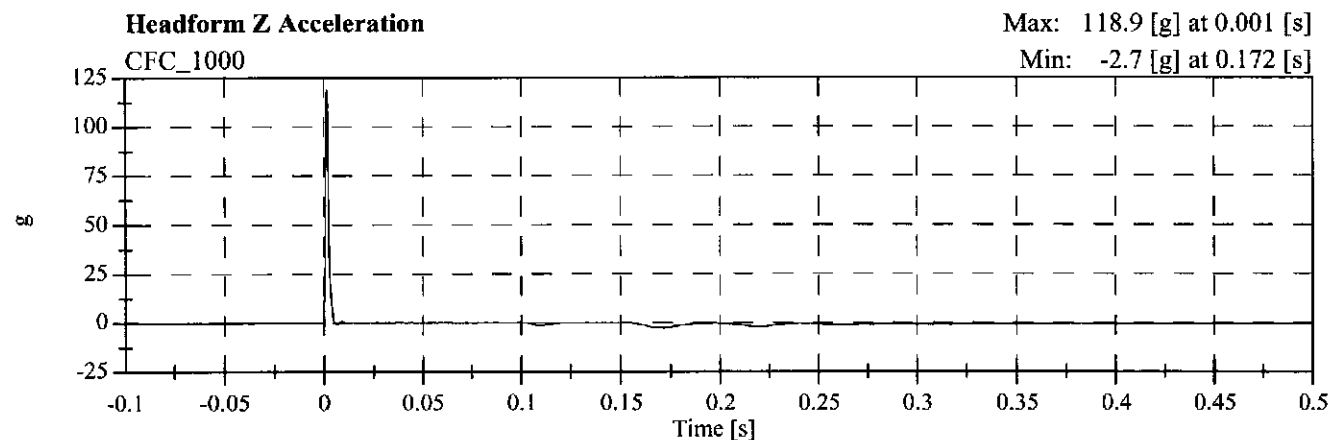
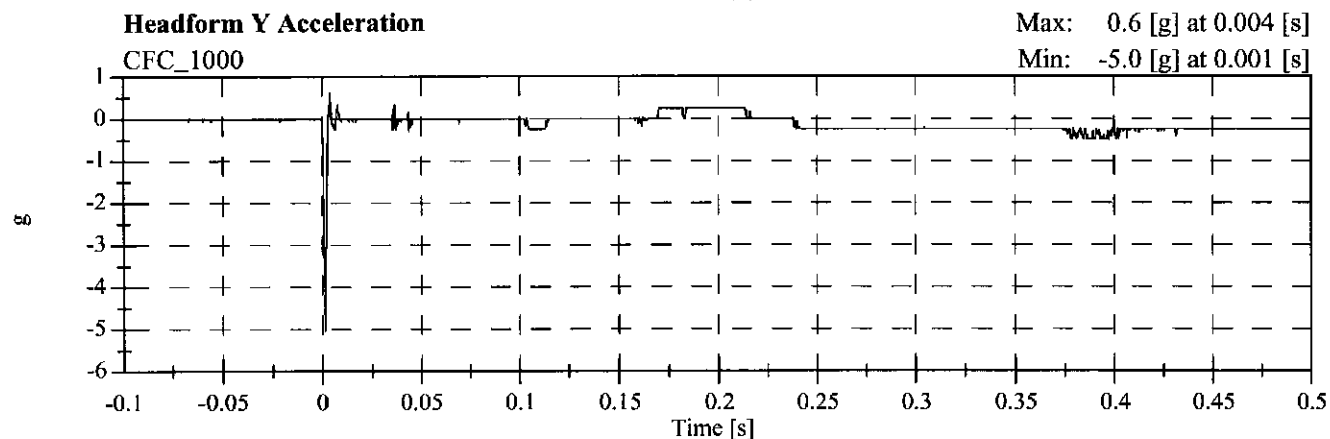
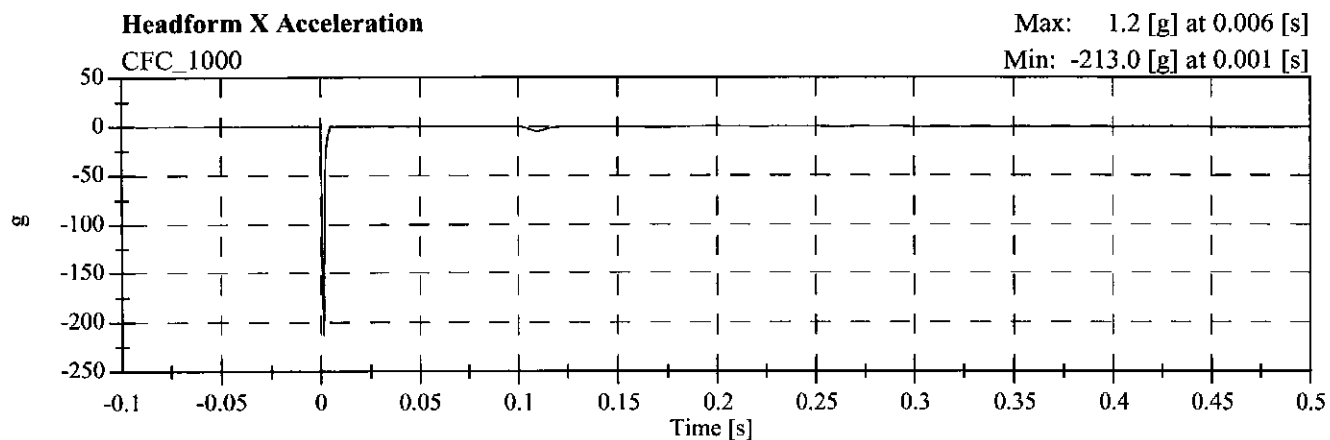
HEAD ACCELEROMETER CALIBRATION INFORMATION

I.D. NUMBER	MANUFACTURER	MODEL NUMBER	SERIAL NUMBER	DATE OF LAST CALIBRATION	DATE OF NEXT CALIBRATION
1 - LONGITUDINAL	ENDEVCO	7264-2000T	J33127	03/16/05	09/16/05
2 - LATERAL	ENDEVCO	7264-2000T	J33019	03/16/05	09/16/05
3 - VERTICAL	ENDEVCO	7264-2000T	J32782	03/16/05	09/16/05

REMARKS:

FMVSS 201U - Headform Calibration Drops

FMH0062 - March 24, 2005



**PART 572L
HEAD DROP POST-TEST**

MANUFACTURER:		FIRST TECHNOLOGIES SAFETY SYSTEMS	
SERIAL NUMBER:		805	
CALIBRATION DATE:		March 24, 2005	
TEST PARAMETER	SPECIFICATION		TEST RESULTS
TEMPERATURE	19°C to 26°C		23.9
RELATIVE HUMIDITY	10% to 70%		20
PEAK RESULTANT ACCELERATION	225 Gs to 275 Gs		251.1
PEAK LATERAL ACCELERATION	15 Gs Maximum		2.7
IS ACCELERATION CURVE UNIMODAL?	YES		YES

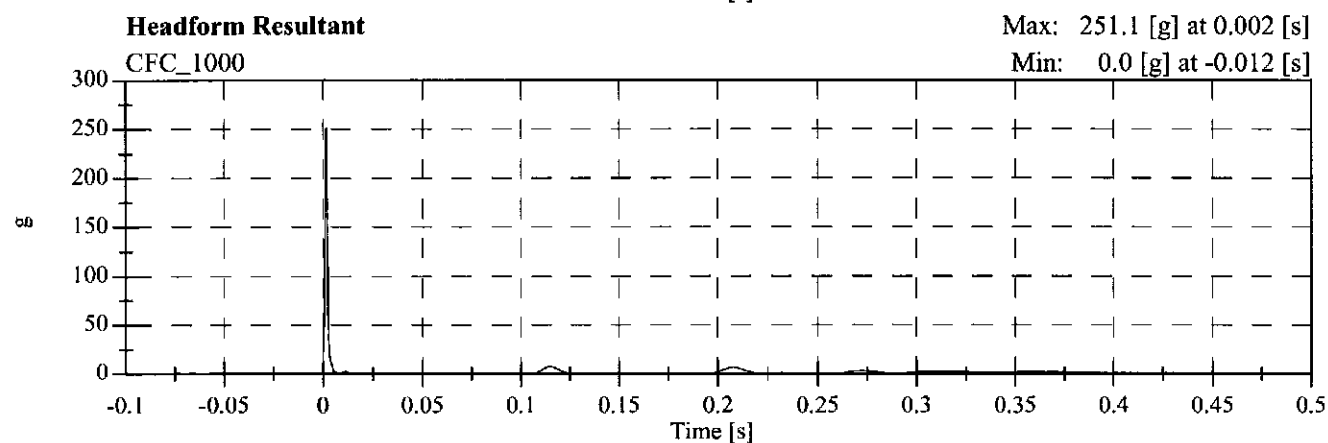
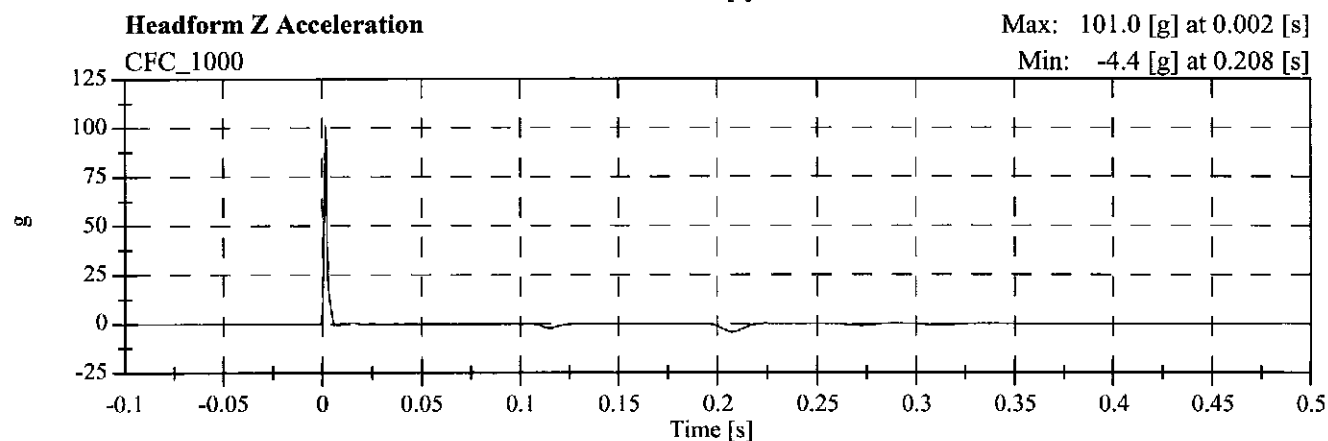
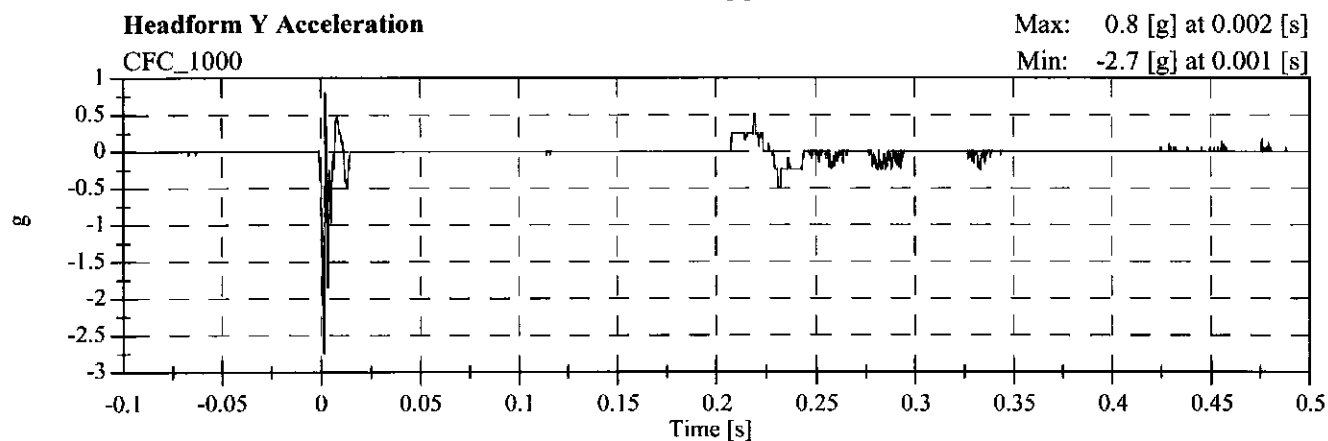
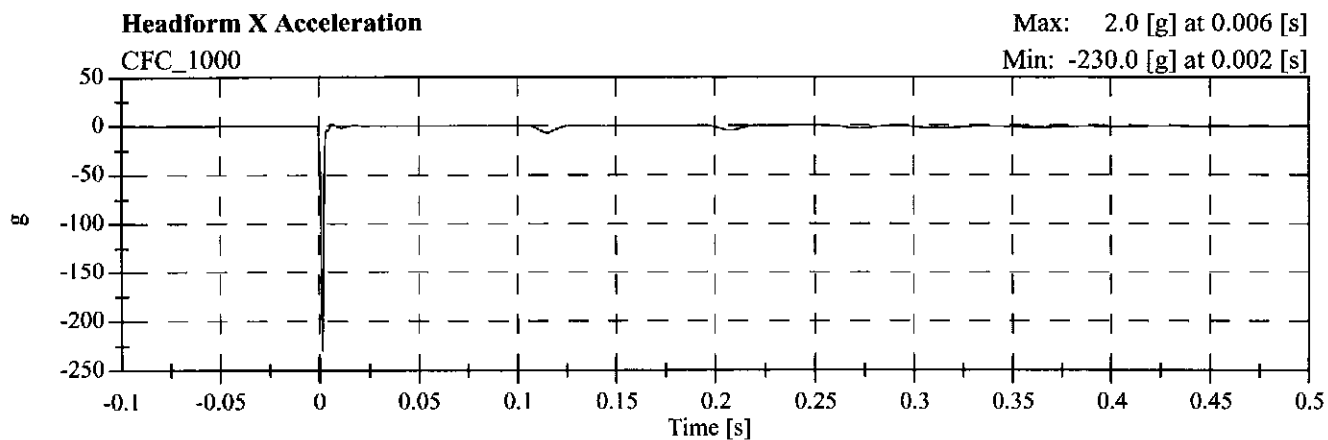
HEAD ACCELEROMETER CALIBRATION INFORMATION

ID. NUMBER	MANUFACTURER	MODEL NUMBER	SERIAL NUMBER	DATE OF LAST CALIBRATION	DATE OF NEXT CALIBRATION
1 - LONGITUDINAL	ENDEVCO	7264-2000T	J38127	03/16/05	09/16/05
2 - LATERAL	ENDEVCO	7264-2000T	J37980	03/16/05	09/16/05
3 - VERTICAL	ENDEVCO	7264-2000T	J37854	03/16/05	09/16/05

REMARKS:

FMVSS 201U - Headform Calibration Drops

FMH0805 - March 24, 2005



**PART 572L
HEAD DROP POST-TEST**

MANUFACTURER:		DENTON SAFETY SYSTEMS	
SERIAL NUMBER:		0355	
CALIBRATION DATE:		March 24, 2005	
TEST PARAMETER	SPECIFICATION		TEST RESULTS
TEMPERATURE	19°C to 26°C		23.9
RELATIVE HUMIDITY	10% to 70%		20
PEAK RESULTANT ACCELERATION	225 Gs to 275 Gs		243.8
PEAK LATERAL ACCELERATION	15 Gs Maximum		4.8
IS ACCELERATION CURVE UNIMODAL?	YES		YES

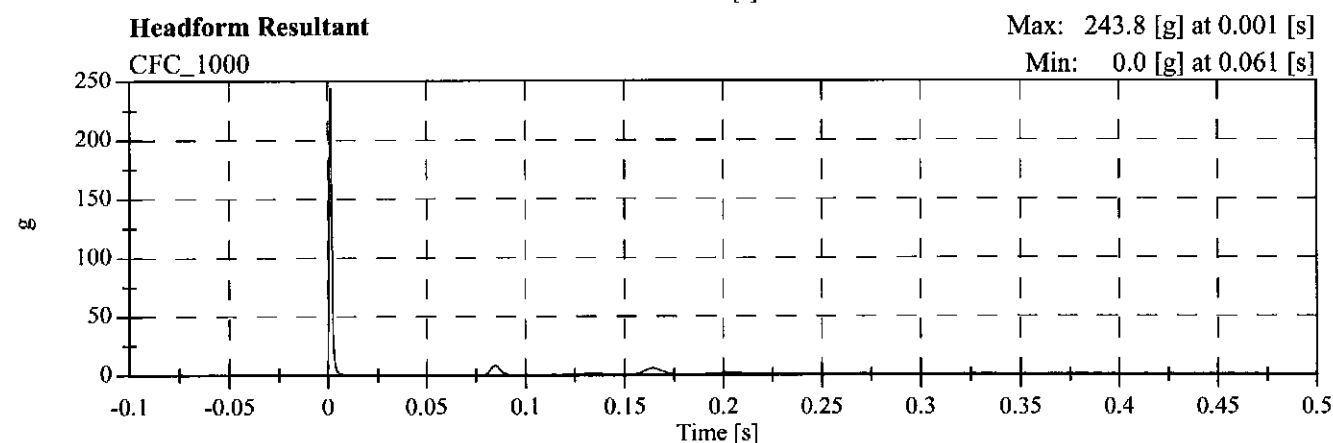
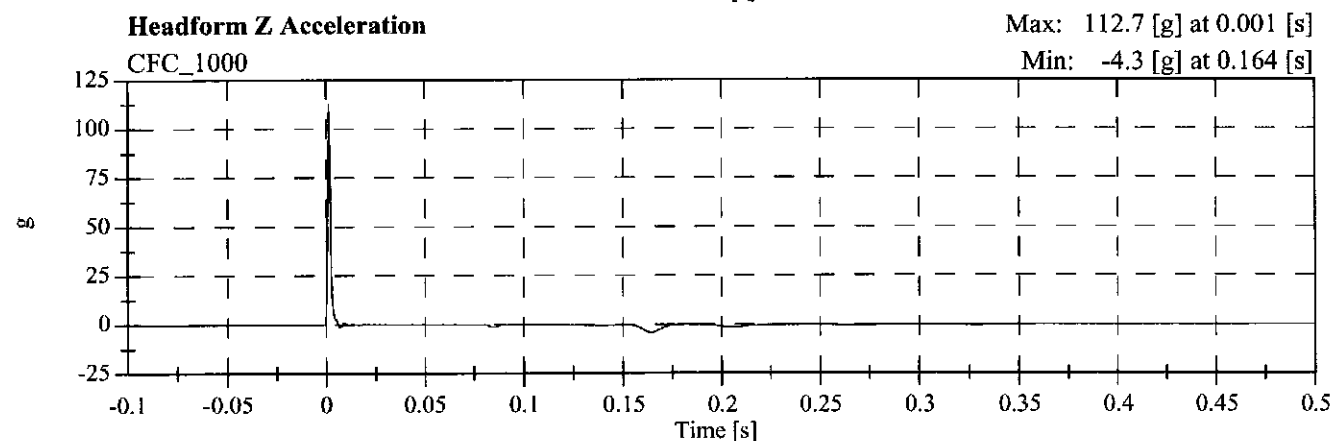
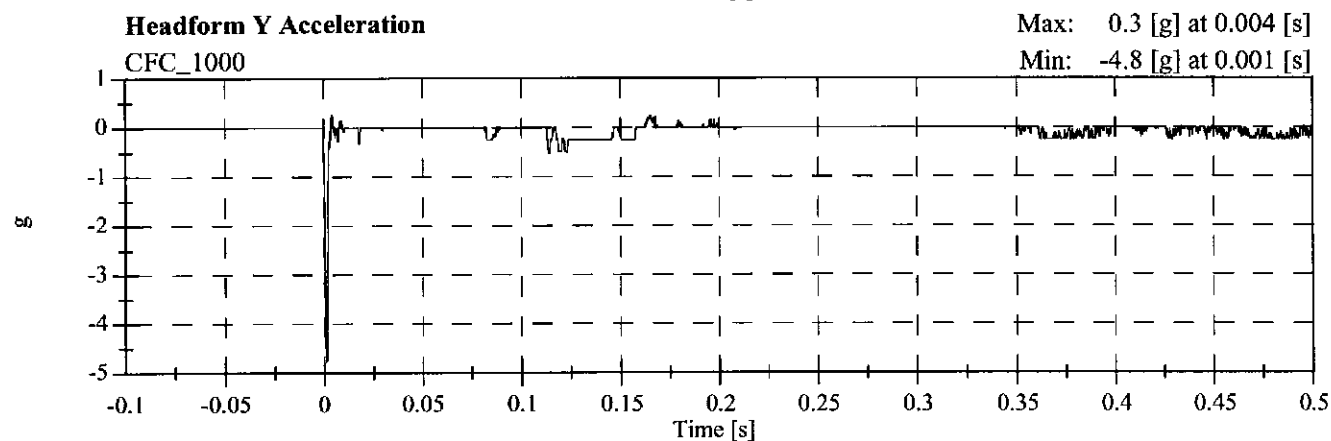
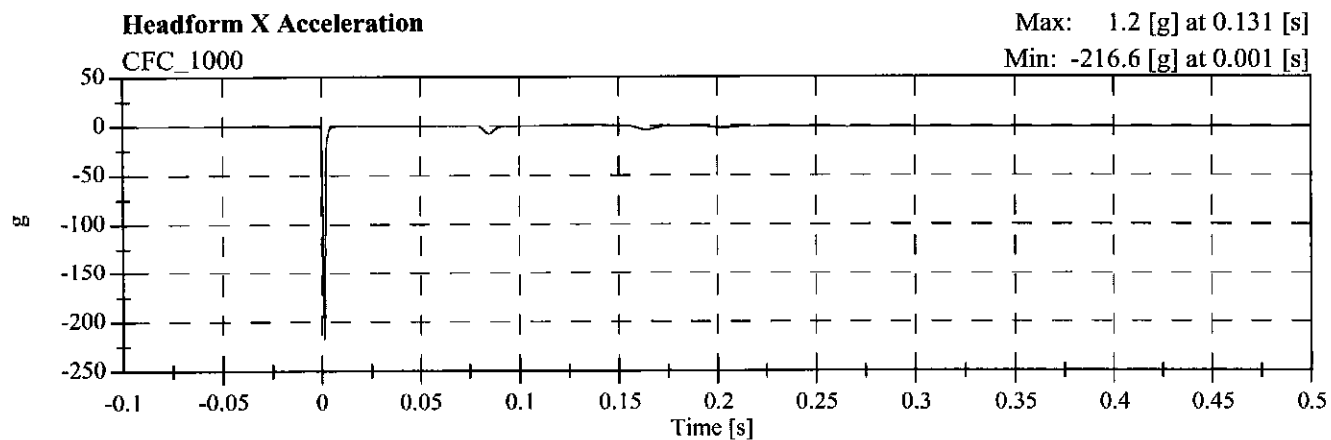
HEAD ACCELEROMETER CALIBRATION INFORMATION

I.D. NUMBER	MANUFACTURER	MODEL NUMBER	SERIAL NUMBER	DATE OF LAST CALIBRATION	DATE OF NEXT CALIBRATION
1 -LONGITUDINAL	ENDEVCO	7264-2000T	J28671	03/16/05	09/16/05
2 - LATERAL	ENDEVCO	7264-2000T	J32779	03/16/05	09/16/05
3 - VERTICAL	ENDEVCO	7264-2000T	J25854	03/16/05	09/16/05

REMARKS:

FMVSS 201U - Headform Calibration Drops

FMH0355 - March 24, 2005



**PART 572L
HEAD DROP POST-TEST**

MANUFACTURER:		FIRST TECHNOLOGIES SAFETY SYSTEMS	
SERIAL NUMBER:		1255	
CALIBRATION DATE:		March 24, 2005	
TEST PARAMETER	SPECIFICATION		TEST RESULTS
TEMPERATURE	19°C to 26°C		23.9
RELATIVE HUMIDITY	10% to 70%		20
PEAK RESULTANT ACCELERATION	225 Gs to 275 Gs		270.5
PEAK LATERAL ACCELERATION	15 Gs Maximum		11.2
IS ACCELERATION CURVE UNIMODAL?	YES		YES

HEAD ACCELEROMETER CALIBRATION INFORMATION

I.D. NUMBER	MANUFACTURER	MODEL NUMBER	SERIAL NUMBER	DATE OF LAST CALIBRATION	DATE OF NEXT CALIBRATION
1 - LONGITUDINAL	ENDEVCO	7264-2000T	J41006	03/16/05	09/16/05
2 - LATERAL	ENDEVCO	7264-2000T	J40994	03/16/05	09/16/05
3 - VERTICAL	ENDEVCO	7264-2000T	J41007	03/16/05	09/16/05

REMARKS:

FMVSS 201U - Headform Calibration Drops

FMH1255 - March 24, 2005

